Majestic Plants Are Full of Modern Equipment

(Concluded from Page 1, Column 1)

with remarkable rapidity, and the ready-for-shipment refrigerators disappear over a conveyor hill into freight cars.

Cooling units are made in a separate plant, attached to the factory, which makes the chassis for the Majestic radio. This plant is almost running over the top and bursting out at the sides with machinery. Grinders, lathes, drills, milling machines, lappers, polishing machines, testing instruments — literally thousands of these production tools are arranged in orderly rows in this factory.

The first operation here is the making of the switch panels, requiring a riveting machine. Comes next the testing of check valves, and the grinding of rollers and bushings for the fan. Arter, and Brown & Sharp grinders are used for these operations, while a Heald drill press nearby is at work on gaskets.

Seven Cincinnati outside diameter grinders are next in line. These machines are able to turn out 3,000 finished pump rotors in a full working day. Four operations of rough and finish grinding are necessary before the part is considered ready for release. The outside diameter is held to a tolerance of .0004 of an inch.

Grinding

The ends of these rotors, held to a tolerance of .0002 of an inch, are rough and finish ground by four Pratt & Whitney surface grinders. Seven Universal spline grinders then take up the task and grind four slots (.0003 of an inch tolerance) in each rotor.

The back of the rotor's face is finished by three Brown & Sharp grinders, after which two Arter grinders put a recess on the stem of each rotor.

Pump bearing plates, into which the rotor fits, are ground out by nine Cincinnati grinders, three Heald Gage-o-matics, nine Bryant No. 3's, three Pratt & Whitney and three Blanchard grinders.

Pratt & Whitney grinders rough and finish grind two sides of the pump tap, which is held to within .005 of perfect flatness.

To grind inside and out the motor rotor sleeve, nine Bryant, three automatic feed Arter, two Pratt & Whitney, and four Heald grinders are used. An American vertical hydraulic press completes the job of turning out the sleeves.

Pump Bodies

Pump bodies are finish ground to a tolerance of .0003 of an inch. The internal grinding is done by Heald machines, and the remainder on Sundstrand steel lathes. A large Niagara washer cleans the pump bodies.

Adjoining this humming room, which contains all the grinders enumerated above, is a special room reserved for lapping machines. According to Manager Huntington, of this department, the 29 Norton lapping machines contained therein constitute the world's largest assembly of that type of machinery.

These machines can lap in one day 12,000 vanes, 3,000 rotors on end, 3,000 caps on two sides, 3,000 bearing plates on one side, 12,000 rockers on end, 3,000 bearing plates on two sides, and 3,000 seats!

Not satisfied with this proud group, Mr. Huntington and his cohorts are building a special lapping machine of immense proportions, which will lap all compressor parts at one and the same time, with suspended Arkansas oil stone.

Vanes, shafts, and float valve needles are ground from stainless steel by Brown & Sharp and Radiac special machines to a degree of accuracy said to be absolute.

While the casual visitor may be confused and bewildered by the profusion of grinding machines all about him in the cooling unit manufacturing plant, he never fails to revive and take a keen interest in the testing instruments, which appear at regular intervals along the journey.

Among the most interesting of these testing instruments are the Zeisoptometers, made in Jena, Germany. These devices test the flatness of parts by means of light interference. The operator inserts the part, and watches an illuminated scale which is projected on a tiny screen, reminding one of old-time magic lantern shows.

Special Instruments

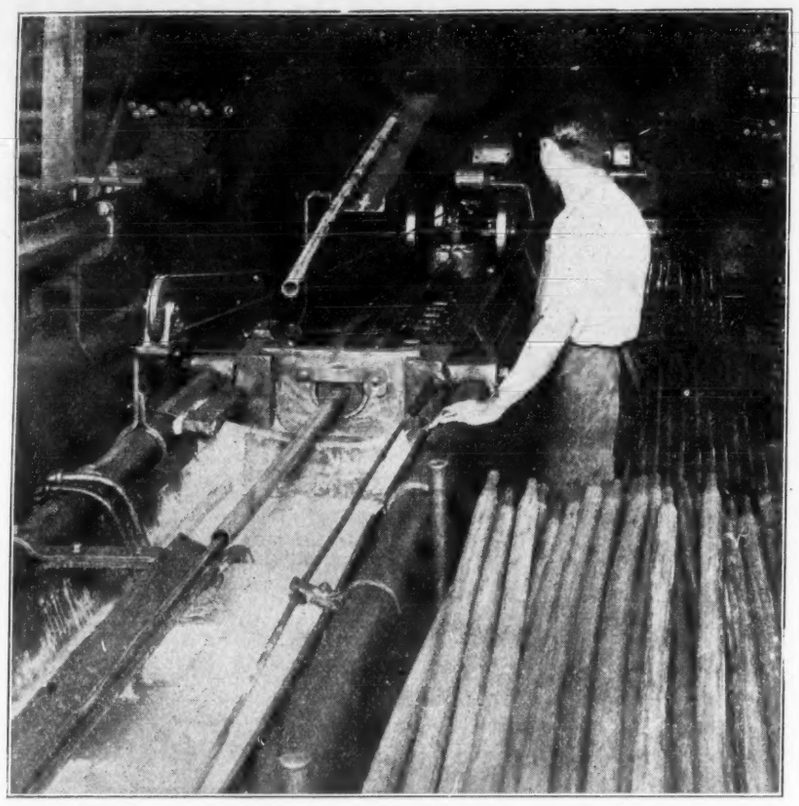
Another interesting measuring instrument, made by the Sheffield Machine and Tool Co., was designed especially to fit in with the Grunow theories of line production and girl operators. A part is inserted in one of these devices, and the operator simply watches three lights, which resemble miniature traffic signals.

If the part is exactly the right size, a brown light appears, the part is ejected, and the operator places it in the proper container. Green or red lights indicate that the part is too large or too small, and it is placed in the proper rejection container.

Thus low-grade help is able to do a competent job on a task formerly confined to high-grade employes.

Girls are employed throughout all the Majestic plants. Their tasks are light, and they are apparently perfectly satisfactory in all respects. For the most part they are paid on a piece-work basis.

Little From Big



Making little ones out of big ones is the job of this machine, which is an important production tool in any copper tubing factory. The tubing is drawn and redrawn through steel dies until it has the required diameter.

Everything Moves In Servel Factories

(Concluded from Page 1, Column 5)

quer, run through a tunnel dryer, and receive trim and hardware. All the lacquer used is pumped to various spray booths in the factories from one central plant.

A huge foundry, which is largely employed at making gas engines (for export), trucks, dollies, and conveyors, also finds time to produce castings for the refrigerators. This foundry is housed in a mammoth building, and is one of the largest of its kind.

Upon emerging from the foundry, the visitor looks over his shoulder as he hurries along behind guide Cooper at the cyclone separator which tops a neighboring building. This arrangement of pipe and drums is the final act in the workings of the exhauster system, which picks up dust and chips from all over the many factories, blows them to the power plant, and then lets them drop into a furnace to be used as fuel.

Unit Plant

The next building the non-stop-flight visitor enters houses the machinery used for producing the new Servel Hermetic unit. A Wicaco continuous oil groover first catches the eye. This device cuts two grooves into the steel spindle crank shaft, which is an integral part of the unit. The grooves permit force feed lubrication.

A neighboring Cleveland four-spindle automatic grinder is so versatile that Mr. Cooper says it will do anything except smoke cigars and sign checks. At present it is employed at the solemn task of cutting 15-foot steel bars into pistons.

On down the line one sees Edlund drilling machines, and Blakeslee and Crescent washing machines, the latter of which give the metal parts produced by the above mentioned devices a thorough bath.

Smooth Finish

Cincinnati centerless grinders impart a smooth finish to the pistons, shortly before Blanchard grinders work on the end of the pistons.

At this point a line of castings enters the picture. Potter and Johnson chucking machines drill out the main bearing and piston holes, and a Bordon and Oliver turret lathe converts blocks of steel into piston crossheads. Warner and Swasey turret lathes work on the base casting.

This base casting suffers 18 holes to be drilled into it at one time by a special Cincinnati drill press equipped with a United States drill head.

Comes then the fireworks. One bursts upon "Fourth of July avenue," the little lane where electric welders are turned loose on piston shafts. Whenever these machines get into action, the operators are completely immersed in a shower of sparks.

Recovering from the first shock of this pyrotechnical welding display, one is introduced to the Derby Hat. Ladies and gentlemen, the Derby Hat is the drawn steel dome which covers the Servel Hermetic unit. It is made of drawn steel, and has sweated-on spines.

The unit is assembled and placed under the Derby Hat in a special chamber, the humidity of which is kept constant, likewise the temperature. A big Frick ice machine and a Dry-Sys humidifier combine to do the trick. The room is cork-insulated.

Following assembly, the unit is charged with methyl chloride from a big drum which resembles somewhat a miniature water-tower. A roundhouse turntable takes the units through a drying tunnel, where a vacuum is created, previous to the injection of methyl chloride.

Still moving, the cooling units are tested. Blowing air must be directed on the condensers during these tests, for there is no cabinet flue present yet to provide a draft.

Next in line is the tool room, containing die benches on structural steel I-beams, a one-ton hacksaw, and a series of milling, profiling, drilling, grinding, and surfacing machines are in use.

Again back to the starting point, one watches the steel cabinet liners go through the enameling process. The liners are dipped into vats of mixed porcelain (formula a trade secret) for their first coat, and then are dried.

The first coat safely on, the liners are shoved into Ferro oil-heated ovens, and subjected to a heat of 1600 degrees F. Going into the ovens navy blue in color, they emerge red hot, and cool down to a blue black.

Follows then a first white coat, a second drying, a second oven, and a second white coat. These ovens are almost entirely automatic in their action, and require only a couple of asbestos-mitted tenders to keep the liners moving through.

G. E. Announces New Hydrogen Welder

Schenectady, N. Y.—A new automatic welder for atomic hydrogen welding, the first application of automatic equipment to this welding process, has recently been announced by the General Electric Co. The equipment was exhibited for the first time at the recent National Metals Exposition in Chicago.

The new welder is designed for longitudinal seam welding of all kinds. It consists of a clamping mechanism for holding the work, an automatic travel carriage, a welding head and the usual control devices, and other accessories.

The clamping mechanism and travel carriage are of standard types, while the welding head, control, etc., are of special design to suit the use of atomic hydrogen welding.

In addition there is an auxiliary feeding device for feeding filler rod into the arc, as the tungsten electrodes used to form the arc are consumed slowly and do not contribute metal to the weld.

The method utilizes the passage of a stream of hydrogen through the arc between two electrodes.

Refrigeration Field Good Market For Tools

(Concluded from Page 1, Column 3)

ing around the industry. Radio manufacturers, cognizant of the definite sales relationship that exists between the radio and refrigerator, are planning to bring out new units. Crosley, Zenith, and Philco are among the radio concerns which have been giving serious attention to this proposition.

Each of these newcomers will need completely equipped plants. The Majestic Household Utilities Corp. spent millions of dollars on their new factories and production tools. Huge amounts have been expended by others already this year, while those newcomers who have not yet begun real production are still in the market for machinery.

Old for New

Older organizations are scrapping old production tools for new continually. It is a fast-moving industry, and to keep pace with the new developments which appear with such rapid regularity, the well-established companies find it necessary to alter their equipment periodically.

Young and progressive is the refrigeration industry. Executives in this field are more than ready to adopt new methods and devices, if they are convinced that these innovations will make better refrigerators, or do the job more quickly and economically. They do not wait until their machines are worn out before replacing them, but will readily scrap tools in favor of more modern and efficient types.

Ideal Market

This fact, added to the substantial influx of new companies which continue to appear on the scene, make the industry an ideal market for the man who has production tools to sell.

Emerging with flying colors from the present economic depression, the refrigeration industry has established this year new records for sales volumes. Many concerns are reporting substantial increases in earnings over 1929. Expansion plans for the coming year are already well under way. The industry is in a healthy condition.

The man who has production tools to sell, and particularly the manufacturer who is willing to spend some time on research into the production problems of the industry, will find concerns making electric refrigerators to be excellent prospects.

MARKWELL TACKER IS VERSATILE

New York, N. Y.—New uses are being found in the refrigeration industry for the Markwell automatic tacker, according to W. Drypolcher, of the Markwell Mfg. Co.

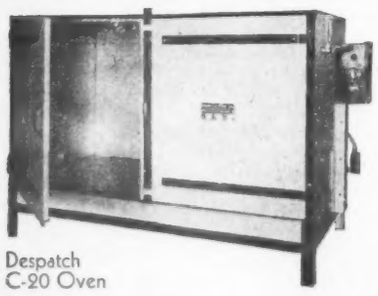
The principal use for this device has been the tacking of gaskets to refrigerator doors; but many companies now report it is being used to tack insulation paper, direction sheets, and shipping tags to crates and cabinets.

SPECIAL TOOLS DESIGNED AFTER RESEARCH

Kenosha, Wis.—Research engineers connected with Snap-On Tools, Inc., have done considerable experimental work in designing and developing special service and manufacturing tools for electric refrigerator manufacturers, according to R. P. Utley of that concern.

Among the tools specially designed by this company are new types of ratchet wrenches, gear pullers, screw drivers, socket wrenches, and box type wrenches.

Uniform Dehydration



Despatch C-20 Oven

of refrigerator units in the service station is secured with Despatch Ovens. Of a scientific design to assure uniform heat distribution, these ovens are sturdily built to give long service. Despatch ovens are well adapted to service station work and will give positive and uniform results with low operating costs.

Already, over 100 service stations have standardized on this equipment.

Bulletin No. 90 describes these service station ovens in detail. Write for your copy today.

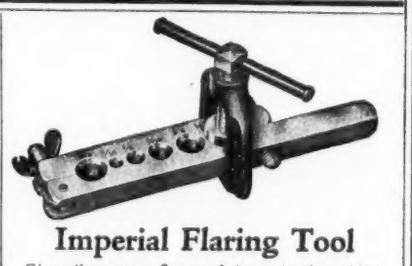
DESPATCH OVEN CO.
623 Ninth Street Southeast
MINNEAPOLIS, MINNESOTA
REPRESENTATIVES IN PRINCIPAL CITIES

Imperial

Aids To Better Installations

Imperial Tube Cutter

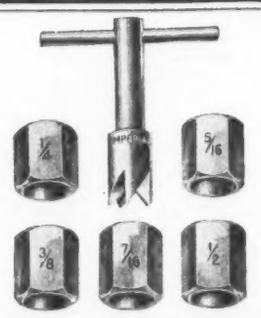
Here is a highly efficient tool for cutting copper, brass, block tin and lead tubing. It takes all sizes of tubing from ⅛" to ⅝" and makes a right-angle cut, quickly and cleanly, leaving no burrs or chips to clog the line. The tubing does not become out of round as when put in a vise. When this tool is used tubing can be cut in half the time required by old methods and a far better job results. No. 94-F Tube Cutter, each $2.50



Imperial Flaring Tool

Gives the proper flare and taper to the tubing for making up joints. A perfect flare means a tight joint and this tool does the work in least time and with utmost simplicity. No loose dies — no vise necessary. No. 93-F takes tubing sizes 7/16", 3/16", ¼", 5/16", ⅜", and ½", each $3.00

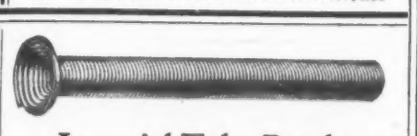
No. 95-F takes tubing sizes ¼", 5/16", ⅜", ½" and ⅝", each $4.00



Imperial Refacing Tool

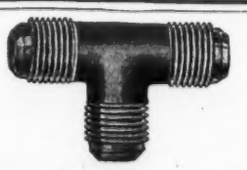
This new tool insures against leaks caused by S. A. E. couplings that do not seat properly. In use, the coupling is inserted into the correct adapter, then a few turns of the five-fluted hardened steel refacer produces a faultless seat of correct size and taper for a tight and leak-proof joint.

No. 100-F Refacing Tool with adapters for sizes ¼", 5/16", ⅜", 7/16" and ½". Per Set $3.75



Imperial Tube Bender

Just slip this tool over the tubing where the bend is to be made. Then bend both tube and coil by hand to whatever form desired. Seven Tube Benders comprise a complete set. No. 101F Tube Bender Set for tubing sizes ¼", 5/16", ⅜", 7/16", ½" and ⅝". Per Set $2.75



Imperial Brass Forgings

Accurately made to meet all the requirements of Iceless Refrigerator Manufacturers. Will not leak. Let us quote on your requirements.

Send for New Catalog

The Imperial Catalog, just off the press, illustrates and describes the complete Imperial line of Brass Forgings, Valves, Manifolds, Tools, etc. To become acquainted with the newest and most modern, send for this catalog today. It's free.

THE IMPERIAL BRASS MANUFACTURING CO.
565 SOUTH RACINE AVE. - - - CHICAGO, ILL.

In Three Parts—Part 1

ELECTRIC REFRIGERATION NEWS

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NEW DEVELOPMENTS WILL BE STRESSED AT A.S.R.E. MEETING

Attractive Program Prepared for New York Session

New York, N. Y.—New developments in the fast-growing refrigeration field will be in the limelight as the American Society of Refrigerating Engineers gets together for its twenty-sixth annual meeting at the New Yorker Hotel, December 3-6. Variety will be the keynote of the convention, and such subjects as quick-freezing, manufacturing carbon dioxide ice, humidity of cold storage, frozen brines, ozone, cold storage and applications of the A. S. R. E. and New York test codes tend to substantiate this fact.

Six sessions will be devoted to technical subjects, the first getting under way Wednesday afternoon immediately following the welcome lunch, in the North Ballroom of the New Yorker, at which Harry D. Edwards, president of the society, will open the festivities. Unveiling of the Refrigerating Exhibit will be the duty of A. W. Oakley. The opening session has a strong appeal to advocates of quick-freezing, and a number of interesting papers on this latest development in refrigeration will be taken up.

Entertainment for the engineers on Wednesday evening includes a dinner at the Home Making Center in the Grand Central Palace, followed by an inspection of the Westinghouse Lighting Institute's permanent and extensive display in the same building. The ninth National Exposition of Power and Mechanical Engineering will also be under way at the Palace, and the engineers will have the opportunity to look over the many exhibits of electrical equipment. More than 400 exhibitors have taken space at the Power Exhibition, so that the delegates will be able to get plenty of exercise strolling about the exhibition floor.

All sessions, with the exception of the one Friday afternoon, will be held under the roof of the New Yorker. The joint session with the American Society of Mechanical Engineers on Friday afternoon will take place at 29 West 39th Street. The New Yorker Hotel, which is equipped with 422 tons of refrigeration, should make the men, whose business is that of extracting heat, feel right at home. All public rooms, including the ballroom, are ventilated with washed cool air.

The climax of the convention will be reached on Friday evening with the grand jamboree in the ballroom at 7:00

(Concluded on Page 4, Column 4)

SAFETY CODE, PAGE 10

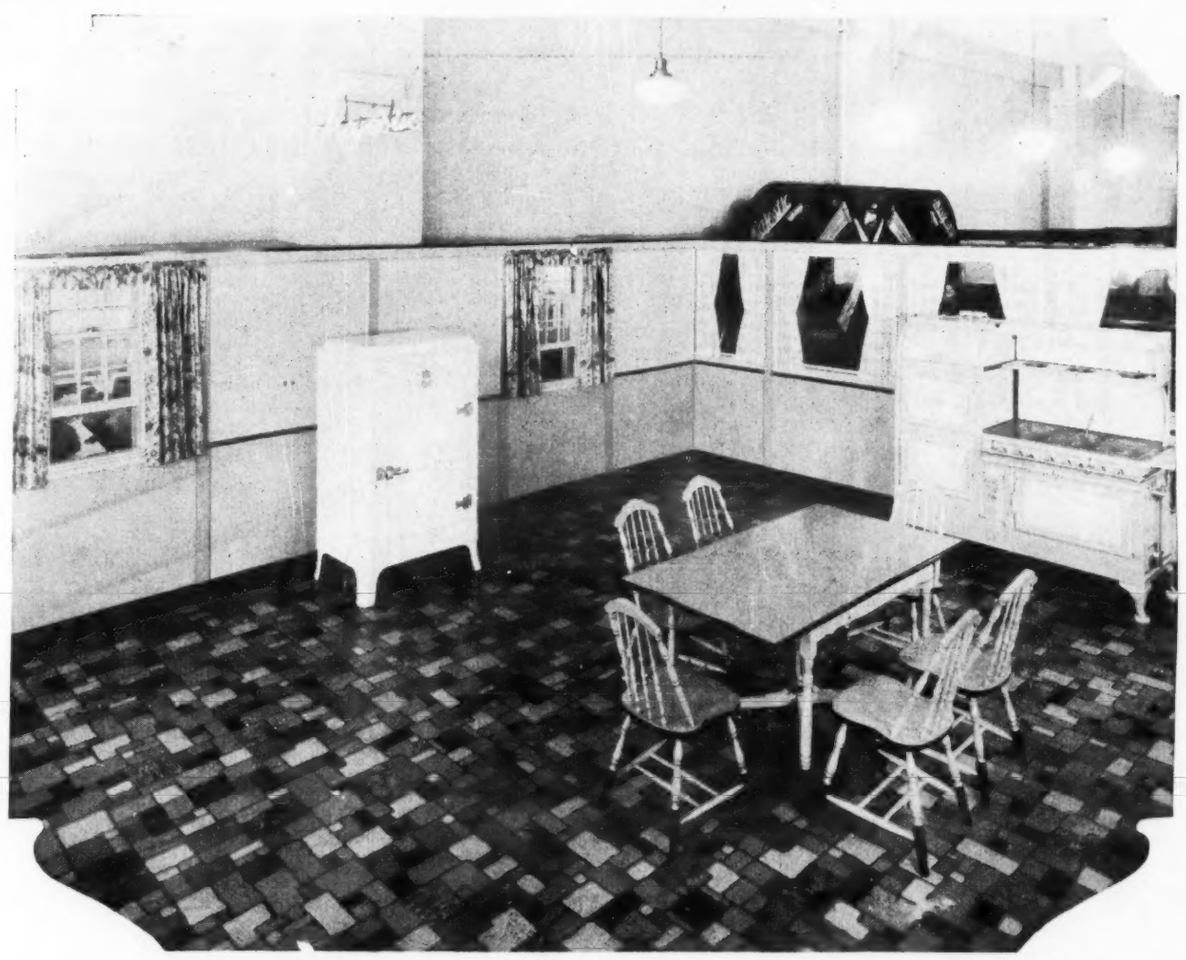
THE complete text of the Standard Safety Code as approved by the American Standards Association is printed on Pages 10 and 11 of this section of this issue of ELECTRIC REFRIGERATION NEWS. In the last two or three years, the NEWS has traced the development of this Standard Code sponsored by the American Socieyt of Refrigerating Engineers, and has printed various versions as they have been proposed only to be later amended. The Code which appears in this issue is the final word, for the present at least, and the readers of the NEWS who wish to study its provisions may do so secure in the knowledge that they have before them the Code in the form in which it has been approved by a long and impressive list of interested organizations.

Automatic Selling

THE automatic, coin operated, vending machine has for a long time been seeking the aid of refrigeration in order that it might enlarge its activities in the handling of perishable foods. The Pink Section, or Buyer's Guide, which is part of this issue of Electric Refrigeration News, reviews the progress which has been made in uniting these two forces for distribution, and in addition describes other interesting activities in the vending machine field.

A number of machines recently developed are illustrated in the Pink Section's pages.

Studied Simplicity



Boston, Mass.—A Majestic refrigerator reposing in a typical Cape Cod kitchen has been subject of much interest on the part of pedestrians on Commonwealth Avenue. Majestic Distributors, Inc., distributors for Majestic products in New England, set up the window display pictured here at its headquarters at 539 Commonwealth Ave.

Its typical Cape Cod atmosphere is brought about through the clever placing of paintings which can be seen through the windows. The color scheme is Nile green with buff trim. Contrast in the display is added by the vari-colored linoleum which brightens up the kitchen besides attracting passers-by with its attention-getting qualities.

Cooperative Sales Plan Sets Million as 1931 Goal

Electric Refrigeration Bureau of N.E.L.A. Announces Campaign Schedule

New York, N. Y.—The sale of 1,000,000 domestic refrigerators in 1931 is the objective set by the Electric Refrigeration Bureau of the National Electric Light Association as the first step in its three-year activity. National advertising, effective organization of all interests concerned, and the whole-hearted help of the Electric Refrigeration Bureau, will be the chief factors in the work, which is confidently expected not only to reach the 1,000,000 mark in 1931, but to set records far beyond that impressive figure in the following two years.

Detailed plans already have been worked out and call for three campaigns during the year. The spring campaign will get under way April 1 and end June 30. The Fall campaign will start September 7 and last until October 16. The year's activities will be brought to a close with the Christmas campaign, November 16 to December 24. During the summer months, always marked by refrigeration activity, the united forces will maintain their customary drive for business without the aid of special campaigns. The national advertising will be concentrated in the campaign periods.

With the plans worked out and the national organization set up—the country has been divided into twelve regions with a regional director at the head of each region—the biggest job will be the selling of the plan in its wealth of detail to the local organizations, utilities and refrigerator distributors and dealers, without whose aid the goal cannot be reached. The next few months will be devoted to that task and every effort will be made to put full information in regard to the plan into the hands of those who must be depended upon for its success.

The sales program as outlined in the prospectus just issued by the Electric Refrigeration Bureau contemplates the sale of electric refrigerators to 5 per cent of all domestic electric customers during 1931. As there are approximately 20,000,000 wired homes in the United States today, this means the sale of 1,000,000 domestic refrigerators.

Co-operation on a scale never before attempted will be the keynote of the refrigeration activity throughout the year. The tie-up between national, regional and local organizations will be maintained on a more intimate basis than has been the case in the past. Local advertising will be encouraged, and local committees will be formed to advance the work.

The national budget includes an expenditure of $1,000,000 for the three-year plan, this fund to be subscribed by the manufacturers of electric refrigerators. The money will be used for national advertising and for organization activities, and will be spent in addition to the regular advertising appropriations of the various manufacturers.

Local advertising and local promotional activities will be paid for by the local committees and the organizations which they represent.

As told in the October 22 issue of the NEWS, J. E. Davidson, of the Nebraska Power Company, is national chairman of the Electric Refrigeration Bureau. The complete list of regional directors and members of the various committees was also printed in that issue. G. W. Allison is secretary of the Bureau and in active charge of the work of the N. E. L. A. offices, 420 Lexington Avenue, New York.

The schedule mapped out for the campaign during 1931 follows:

Jan. 1—Local advertising material available.

(Concluded on Page 9, Column 3)

Winston Paul, Pioneer Distributor, Relinquishes Frigidaire Franchise

New York, N. Y.—After nine years of distributing Frigidaire electric refrigerators in the New York territory Winston Paul, president of the Domestic Electric Co., Inc., has terminated his active connection with Frigidaire. Hereafter Frigidaire distribution in New York will be handled by a factory branch, which will retain most of the personnel of the Domestic Electric organization.

To express official and public appreciation of the work Mr. Paul has done to promote Frigidaire sales in the New York territory, the Frigidaire Corporation gave the pioneer distributor and his organization a dinner in the Hotel Astor, New York, on the night of November 7. About 400 were present.

A multi-course dinner, a tireless orchestra, an exuberant spirit of good fellowship, and a program of well-known speakers combined to make the evening a high-powered farewell to Mr. Paul.

Among the aces in the deck of speakers introduced by Toastmaster E. G. Biechler, president of the Frigidaire Corp., were Vice-Presidents Charles F. Kettering and J. L. Pratt, of the General Motors Corp.; Katharine A. Fisher, director of the Good Housekeeping Institute; Mrs. W. Maloney, Sunday editor of the *New York Herald Tribune;* Mrs. Elizabeth Stone Macdonald, head of the Frigidaire Consumer Relations Department; C. M. Eakin, the manager of Frigidaire's new factory branch in New York; "Senator" Ford, a humorist, and Mr. Paul.

Following an apt presentation speech, in which he lauded Mr. Paul for his services to Delco Light and Frigidaire since 1916, Mr. Biechler presented a pair of cuff links to the retiring New York distributor.

In thanking Mr. Biechler and Frigidaire for the gift and the testimonial dinner, Mr. Paul discussed at length his enjoyable connection with the refrigeration industry, and affirmed that his retirement was an entirely voluntary act, taken so that he might devote his entire time to other business pursuits.

Mr. Eakin, who is now responsible for Frigidaire distribution in New York, was formerly Mr. Paul's first assistant. He pledged himself to carry on with the policies established by Mr. Paul, and announced that the organization would remain practically intact.

"There's no depression to worry about," said Mr. Kettering. "Business is just out of gear. The chief reason, I think, is industrial monotony. We have been making too much of the same sort of thing.

"A great field lies almost unexplored before the refrigeration industry in air conditioning and room cooling. We've been adept at raising temperatures in buildings, but poor at lowering them. That's the next big development in this industry."

Mr. Pratt stressed the cultivation and keeping of public good will as the most important single asset any business or organization can have.

During the last three weeks of Mr. Paul's jurisdiction over the New York territory, his sales force carried on an appreciation contest, to give their boss a rousing hail-and-farewell in the form of increased returns. Salesman Mulvaney, of the Brooklyn apartment house

(Concluded on Page 9, Column 1)

F. S. Snyder Testifies

TRUE to the traditions of New England conservatism, Frederick S. Snyder, chairman of the Board of the Institute of American Meat Packers, has had little to say for publication in regard to quick-freezing, although his plant in Boston has been freezing all of the Birdseye meats sold in Springfield. Testifying under oath in the Packers' Consent Decree hearings in Washington, Mr. Snyder naturally permitted the demands of truth to overcome his conservatism and made a straightforward statement of his firm belief in the future of quick-freezing. He also attests the truth of the oft-repeated and often doubted statement that General Foods paid $22,000,000 for the Birdseye process.

His direct testimony relating to quick-freezing will be found in the Refrigerated Food Section of this issue, beginning on the first page. His testimony under cross-examination will be printed in the December 3rd issue.

THEATRE CONTEST ADDS TO G. E. CHRISTMAS SALES

Cleveland, Ohio—General Electric officials are in hopes that S. R. O. signs will be in vogue in the Christmas theatre contest they have arranged for salesmen operating under dealers and distributors. The play, "For Men Only," has for its plot the time-worn problem confronting husbands, that of buying the Christmas present for the family.

To make the contest very interesting, a Christmas Contest Chart has been neatly devised so as to reproduce the orchestra floor of a large theatre. In order to hang out S. R. O. signs each organization will have to fill one thousand seats. The dealer's or distributor's quota will determine the number of seats that are filled by each sale of a General Electric refrigerator. If the quota is fifty machines, twenty seats are filled for every refrigerator sold. To fill these seats, special stickers of bald-headed men are furnished.

Progress of the contest will be indi-

(Concluded on Page 12, Column 3)

RICHMOND-SPEAR READY TO MARKET NEW MODEL

Philadelphia, Pa.—The Richmond Engineering Company, manufacturers of the Richmond-Spear Circulating Ice Water Generators, have announced a new model after several months of intensive research and testing. The circulating ice water generator is adaptable for commercial, industrial and institutional installation. The Richmond-Spear generators are manufactured in varying sizes.

J. J. Provost, recently made general manager, announces the installation of a Richmond-Spear circulating ice water generator on the U. S. S. Rochester.

WESTINGHOUSE TO SALUTE REFRIGERATION INDUSTRY

Pittsburgh, Pa.—An interesting discourse on the ice and refrigeration industry in the Westinghouse Salute will be broadcast Tuesday night, November 25, through a national hook-up of 36 radio stations. The program will originate in the studios of Station KDKA at Pittsburgh.

Gardner Poole, president of the American Institute of Refrigeration, will be guest speaker. Frederick G. Rodgers, general program director of Westinghouse radio stations, will also speak. Different stages in the development of the industry will be interpreted musically by the Westinghouse Ensemble.

Sentiment Stimulates Sales

Dayton, Ohio.—Linking sentiment with selling, the Frigidaire organization has developed the idea of giving a Frigidaire for Christmas around a special "Medal of Honor" campaign. Every Frigidaire sold for Christmas delivery will have affixed upon the cabinet a sterling silver medal, about the size of a half-dollar, with the words, "Medal of Honor Frigidaire" and "Christmas, 1930" embossed upon the surface. Room is left upon the face of the medal for any special inscription the giver wishes to have placed upon it.

"Back in the days when our organization was engaged in the manufacture and sale of individual electric light plants for farm homes, we learned the real value of sentiment to sales," G. E. Biechler, president and general manager of the corporation said. "Without the sentiment appeal, the Delco-Light business could never have been built to the proportions it achieved before physical separation of Frigidaire and Delco-Light activities.

"Sentiment, pure human emotion, lies behind ninety-five per cent of all Christmas gift-giving. To meet popular favor and to sell in volume, any product offered for Christmas giving should have sentimental appeal. It should appeal to the heart as well as the head. This is particularly true of the gift which has a utilitarian use in the home."

The Medal of Honor idea, which was worked out several months ago by the sales promotion department, was first submitted to a committee of distributors and branch managers of the corporation. It was the unanimous opinion of this committee that the idea was sound from a merchandising standpoint and that it added to the electric refrigeration business the very touch it needed to make it just what was needed for the Christmas season.

Newspaper advertising, direct mail, and all other sales promotional activities of the Frigidaire organization will be tied up exclusively with the Medal of Honor idea. A 24-page prospectus explaining in minute detail the various activities of the campaign itself has already been mailed to regular Frigidaire dealers. A special adaption of the plan,

suited to the needs of power companies, has also been prepared for Frigidaire's public utility connections.

Officials of Frigidaire Corporation point out that Frigidaire has always experienced a pronounced increase in December business, due to Christmas buying, although it has never before undertaken a Christmas selling campaign of the scope projected for the "Medal of Honor" campaign.

The first distributor to approve the campaign after its completion was C. H. Dyer, of the Von Hamm Young Co., Honolulu, who was paying the factory a short visit late in October. He at once ordered complete equipment necessary for every Frigidaire dealership in the Hawaiian Islands. The next representative of the field to see it was E. A. Lowden, manager of Canadian branches, who was so impressed with its possibilities that he at once arranged to carry it through in all parts of Canada. At European headquarters in Paris, the office organization is now engaged in making the modifications necessary to applying it to Christmas selling efforts in every country in Europe.

Frigidaire dealers and salesmen are being armed for the Model of Honor campaign with a special campaign kit. Each salesman will carry in a leather-covered jewel case a Medal of Honor inscription plate, which will enable the prospect to determine for himself how it will add Christmas sentiment to Frigidaire as a gift.

The salesman will also carry a presentation card suitable for hanging on the Christmas tree, a gift certificate, which authorizes the holder to pick out any household model she may prefer, in the showroom, courtesy cards for prospects who may visit the showroom prior to Christmas, and numerous other bits of sales ammunition to be used in closing business.

Frigidaire dealers and salesmen were already driving hard for business prior to the announcement of the Medal of Honor Frigidaire, due to the impetus of a national sales contest, with a large amount of prize money at stake, plus the fact that many of them must still sell some business in order to qualify for membership in the 1930 B. T. U. Club with the $50, $75 and $150 prize awards that go with it.

It is interesting to note that at the beginning of October a slightly larger percentage of the field organization had made 75 per cent of its yearly quota than had reached the same mark on October 1, 1929.

USED G. E. REFRIGERATOR BRINGS OUT THE BIDDERS

Lebanon, Pa.—When Miles Horst, Palmyra, Pa., advertised an auction sale of his household goods in the Lebanon *Daily News* a few weeks ago, the advertisement was worded to feature his three-year-old Model R-52 General Electric refrigerator.

First information of the sale was received by the Lebanon branch manager of N. K. Ovalle, Inc, when the advertising manager of the newspaper called him to ascertain the approximate value of the machine. As a result of the advertisement, eleven other persons in the community called the branch store for the same information.

At the sale proper, seventeen bidders competed for the General Electric refrigerator, and the auctioneer bid it in himself at $207.00.

Branch manager Welch states that since the machine was originally installed the only service rendered on it was a temperature adjustment. Upon checking it since the installation in its new home, he found the machine operating perfectly.

A General Electric refrigerator model of equal capacity, with an all-steel cabinet, can be purchased new for $253.50, delivered. Total depreciation on the auctioned machine, Mr. Welch has figured out, is about 18.3%, or less than 6.1% per year.

One of the bidders at the auction has already purchased a new model S-62, and three other bidders are prospects who will probably purchase before Christmas.

ARMSTRONG ANNOUNCES EMPLOYEES' PENSIONS

New York, N. Y.—A co-operative retirement program by means of which the Armstrong Cork Company, of Lancaster, Pa., and its 6,000 employees will join forces to provide for the declining years of workers through insured annuities, has been announced by John J. Evans, president of the Armstrong Cork interests. The program also includes group life insurance, sick and non-occupational accident benefits, and total and permanent disability benefits.

All present employees actively at work on December 31, 1930, will be eligible to enroll, and it will be compulsory for new employees to join after six months' service. The plan becomes effective at midnight December 31, 1930, provided at least 75 per cent of all eligible employees have accepted the plan.

The entire cost of the retirement benefits or pensions based on service before the effective date, will be borne by the Armstrong Cork Company. The cost of the other benefits and future pension accumulations will be shared by employer and employees.

BERGHOFF AND BERGHOFF SAIL FOR SOUTH AMERICA

Fort Wayne, Ind.—Gustave A. Berghoff, president of the Wayne Home Equipment Company of this city, together with Edward H. Berghoff, of the company's engineering department, sailed recently from New York for Buenos Aires on an extensive business trip through the Latin-Americas. These men will confer with Wayne representatives in the Argentines, the South American Branch of the AEG, a company which constitutes the General Electric Company of Germany, and in addition, will make a comprehensive survey of business conditions in Latin-America.

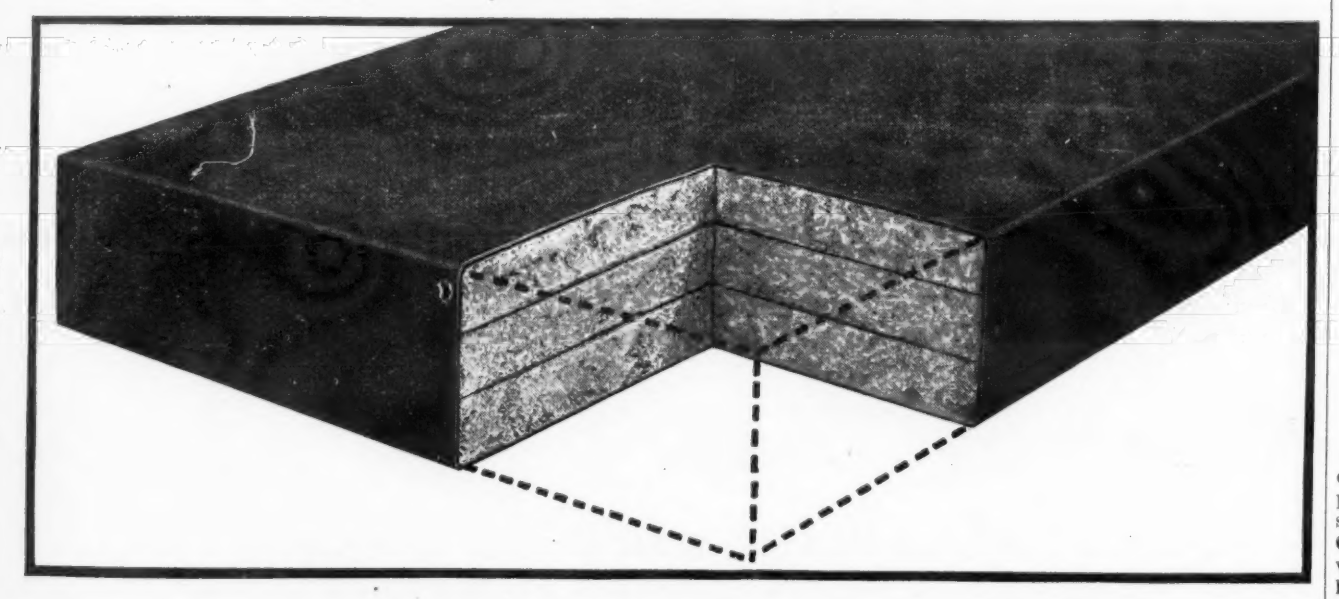
Before leaving the city Mr. Gustave Berghoff announced, by way of expressing his sincere confidence in the immediate improvement in business conditions, that the Wayne Home Equipment Company has already begun a definite six-months production schedule, and that the employes will be kept on a full-time schedule throughout the winter in order to relieve as much as possible the present uncertain condition.

REYNOLDS TO DISTRIBUTE FRIGIDAIRE IN TACOMA

Tacoma, Wash.—C. J. Allgood, field supervisor for General Motors Corporation, and widely known in this territory in the distribution of Frigidaire, announces the appointment of E. W. Reynolds as Frigidaire distributor in Tacoma and Pierce county. Mr. Allgood pioneered and established the first Frigidaire agency in Tacoma eight years ago.

E. H. Chamberlain, formerly with the Frigidaire Corporation, will handle the commercial division for the new distributor.

5 important points in Insulation for Mechanical Refrigerators



You'll find them all in this BALSAM-WOOL SEALED SLAB

1 *Highly Efficient:* Balsam-Wool is a felted, wool mat, made from wood. Its millions of tiny fibres contain "dead" or still air—next to a vacuum, the best insulation known.

2 *Labor Saving:* Balsam-Wool Sealed Slabs are made to any length, breadth, thickness. Wrapped in tough, waterproof paper. Hermetically sealed.

3 *Semi-Rigid:* Flexible enough to fit snugly. Rigid enough for easy handling. They come to you ready to install. And once in place, Balsam-Wool Sealed Slabs are there to stay.

4 *Carefully Sealed:* In addition to their high efficiency, Balsam-Wool Sealed Slabs are odorless, vermin-proof, sanitary, and are carefully sealed against moisture.

5 *Regularly Tested:* Balsam-Wool Sealed Slabs are regularly tested for uniformity and efficiency in our well equipped laboratories. Tests made by impartial authorities show that the average thermal conductivity of Balsam-Wool does not exceed 6.0 B. t. u. per square foot, per one inch thickness, per one degree Fahrenheit difference in temperature in 24 hours.

Let us send you *free*, a Balsam-Wool Sealed Slab, together with engineering data that *proves* the high efficiency of this practical insulation. Write our nearest sales office.

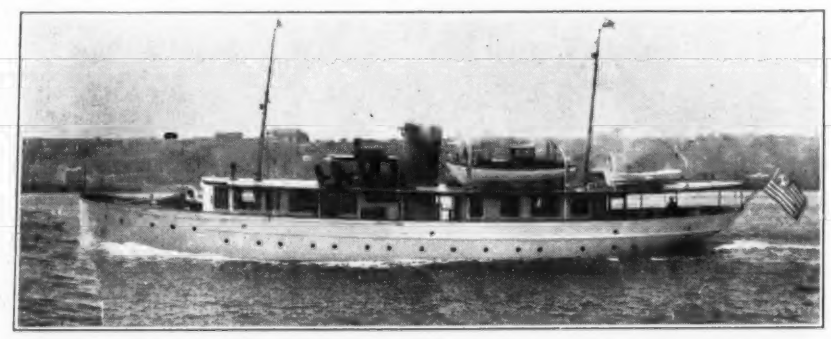
WOOD CONVERSION COMPANY

Mills at Cloquet, Minnesota

Industrial Sales Offices:
360 N. Michigan Ave., Chicago
3107 Chanin Bldg., New York
3084 West Grand Blvd., Detroit

Manufacturers of Balsam-Wool Insulation for Domestic Refrigerators, Motor Buses and Airplanes; Balsam-Wool Refrigerator Car Insulation and Passenger Car Insulation; Balsam-Wool Standard Building Insulation and Nu-Wood Insulating Board

Copeland Equipped



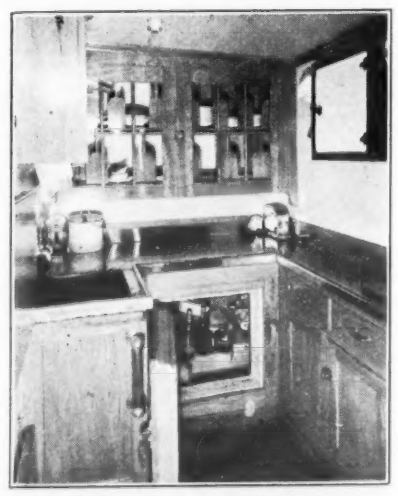
Detroit, Mich.—The Yacht Althea, owned by C. Hayward Murphy, vice-president of the Board of Fire Commissioners of this city, is equipped with Copeland electric refrigeration. The last word in design and fittings, the vessel has all the conveniences of a modern home.

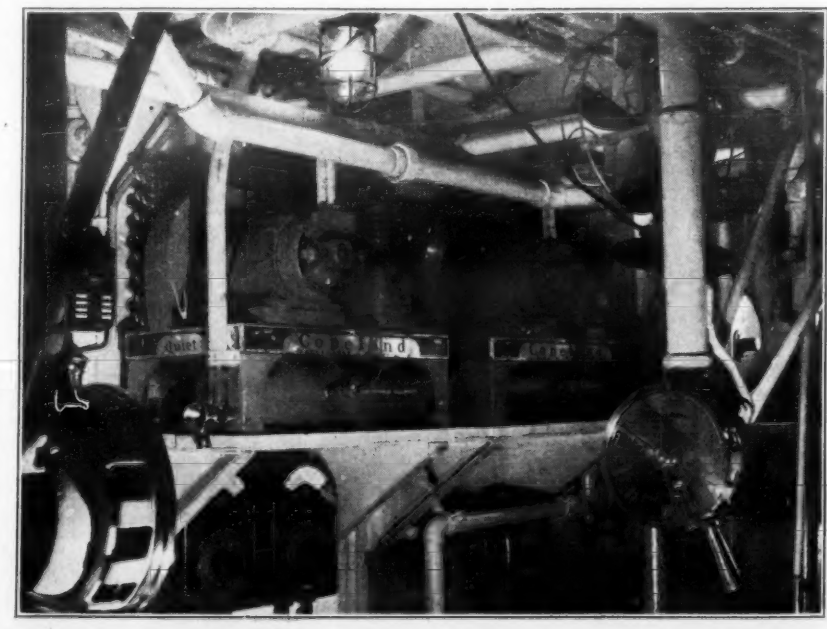
In the galley is a compactly built refrigerator equipped with a Copeland D-20 ice-making tank. A larger storage refrigerator, equipped with special Copeland-Larkin coils, is installed in the lower hold forward. Both of the refrigerators are operated from 2½ h. p. model R Copeland condensing units. These are installed in the engine room.

* * *

At right—The Althea's galley showing the Copeland refrigerator.

Below — Refrigerating machinery in the yacht's engine room.





Tell your prospect why the Monitor Top *saves money*

(The Monitor Top is your strongest selling point.* Feature *it—and the economical operation which it assures)

The Monitor Top is the General Electric Refrigerator salesman's greatest asset.

Its individual beauty of line **is responsible for the General Electric Refrigerator's distinguished modern appearance.**

Its efficient, dependable performance **is responsible for the General Electric Refrigerator's splendid record of reliable service.**

Its sealed-in-steel mechanism **is responsible for the General Electric Refrigerator's incredible quietness—and a cost of operation that amounts to but a few cents a day!**

When you tell your sales story, start at the *Top*. You'll *finish* at the Top!

And this here,

my good man is helping you

over *the top*

Millions of newspaper advertisements, direct mail pieces, sales promotion material, window displays, radio—all concentrating on *one* point—"To own the Refrigerator with the Monitor Top is *true economy*!"

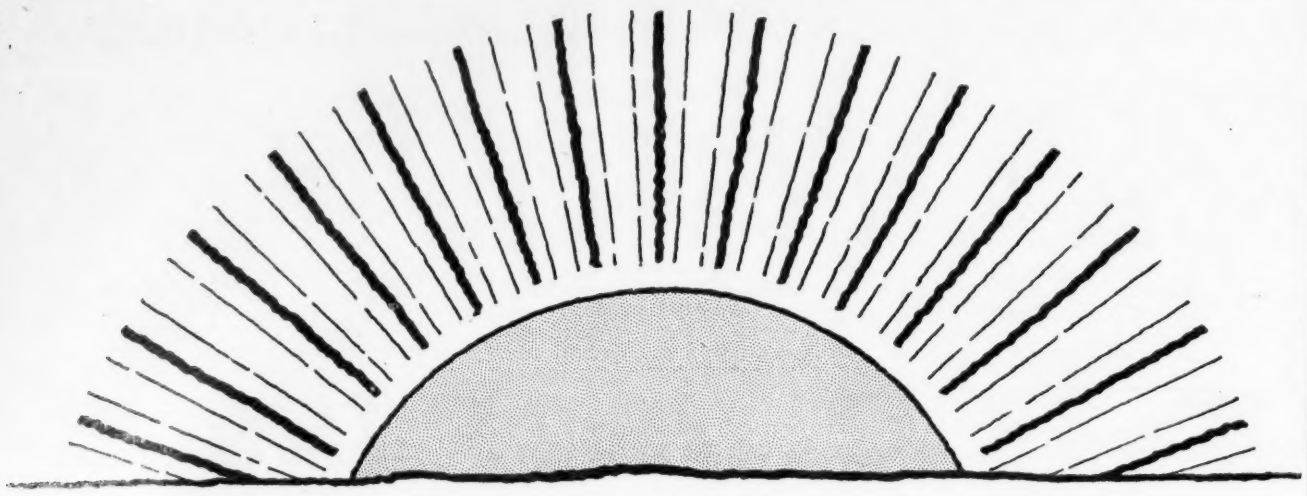
And *on top* of it all, full-page color advertisements in all the leading national magazines.

GENERAL ELECTRIC

ALL-STEEL REFRIGERATOR

ELECTRIC WATER COOLERS • COMMERCIAL REFRIGERATORS • ELECTRIC MILK COOLERS

ELECTRIC REFRIGERATION DEPT., GENERAL ELECTRIC CO., HANNA BLDG., 1400 EUCLID AVE., CLEVELAND, O



COPELAND LOOKS AT 1931

When the smoke of many sales campaigns has rolled away, invariably Copeland has been found doing a sound, consistent, progressive electric refrigeration business.

For years Copeland has kept everlastingly at its task. Each year has seen better Copeland ice machines. Each year has seen a larger, more powerful distributor and dealer organization. Each year the industry in general has admitted that Copeland has done a sound job.

Nineteen-thirty-one will be no exception. With a substantial and gratifying increase in business for 1930 assured, Copeland began to plan for the future and to build aggressively for the dawn of a new year—a year that is confidently expected to lift the Copeland business to new and greater heights.

Copeland knows how to make ice machines. Copeland knows how to sell ice machines. Copeland knows the problems of distributors and dealers. Copeland knows how much money it takes to operate—both from a wholesale and retail standpoint. And Copeland has always met every situation face to face.

The coming year will see greater Copeland progress—greater opportunities for Copeland distributors and dealers—than ever before.

That is Copeland's message for 1931.

COPELAND SALES COMPANY
332 Cass Avenue, Mount Clemens, Mich.

COPELAND
DEPENDABLE • ELECTRIC • REFRIGERATION

BIG PROGRAM SCHEDULED FOR A.S.R.E. CONVENTION

(*Concluded from Page 1, Column 1*)

p. m. At this time refrigeration and all its appurtenances will be pushed in the background. The engineers plan to make this social event an outstanding one, and dinner dance will give way at times to vaudeville attractions.

Wives of visiting engineers will not be forgotten, as the committee has arranged a merry round of activities for them. Bridge parties, teas, theatre parties and shopping will keep the wives busy while their husbands are wrestling with technical problems.

Through arrangements with the Trunk Line Association, the railroads will sell tickets at half-price to A. S. R. E. members and guests at the convention, between New York and their homes. In order to obtain this discount it is necessary that each delegate obtain a standard "green convention certificate" from the ticket agent at the point of departure and have this validated at the Engineering Societies Building in New York, December 2 to 5.

The complete program for the convention is as follows:

TUESDAY

7:00 p.m. Council Dinner—Meeting (at the hotel).

WEDNESDAY

10:00 a.m. Registration Opens.

12:30 p. m. Welcome Lunch — North Ballroom.
Remarks by President of the Society.
Unveiling of the Refrigeration Museum Model—A. W. Oakley.

2:15 p.m.—First Session — North Ballroom—Chairman, Harry D. Edwards, President, A. S. R. E.
Topic: Refrigeration and Food.
"Recent Applications of Low Temperature Refrigeration," Frank Zumbro, research engineer, Frick Company, Waynesboro, Pa.
"Ozone and Cold Storage Foods," Arthur W. Ewell, professor of Physics, Worcester Polytechnic Institute, Worcester, Mass.
"Food Freezing as a Theory," Paul Petersen, consulting engineer, Chicago, Ill.
"Studies in Heat Properties of Foods," A. H. Cooper et al., University of Tennessee, Knoxville, Tenn.

8:00 p.m. A. S. R. E. Night at the Westinghouse Lighting Institute.
Dinner at the Home Making Center.
Inspection of Power Show.
(All events at the Grand Central Palace.)

THURSDAY

10:00 a.m. Second Session—Student Papers and Award of Research Prizes. Chairman, H. Harrison, chairman Research Committee, A. S. R. E.
Address: "The Young Engineer in Modern Industry," A. R. Stevenson, General Electric Co., Schenectady, N. Y.
"Bakery Refrigeration," A. R. Fayed.
"Design of Compressors," J. J. Simpson.
"Studies in Foods," A. L. Smith.
"Volumetric Efficiency of Compressors," J. C. Reed and E. E. Ambrosius.

2:00 p.m. Third Session — Chairman, A. H. Baer, vice-president, A. S. R. E.
Refrigeration Applications—Papers:
"Oil Refinery Refrigeration," J. M. Wadsworth, manager, Independent Oil & Gas Co., Tulsa, Okla.
"Frozen Brines," R. C. Jessup, physicist, Bureau of Standards, Washington, D. C.
"Humidity of Cold Storagefi" Milton W. Browne, consulting engineer, Kansas City, Mo.
"Manufacturing Carbon Dioxide Ice," C. O. Duevel, Jr., research engineer, American Thermos Bottle Co., Norwich, Conn.

FRIDAY

10:00 a m.—Fourth Session—Chairman, A. J. Wood, past-president, A. S. R. E.
Domestic and Commercial Machinery—Papers:
"The Intermittent Absorption Machine," D. F. Keith, Perfection Stove Co., Cleveland, O.
"The Enclosed Motor Compressor, Patent Situation," H. R. Van Deventer, consulting engineer, New York, N. Y.
"Basis of Commercial Machine Test Code," John Wyllie, Jr., Kelvinator Corp., Detroit, Mich.

2:00 p m. Fifth Session—Joint Session with A. S. M. E. (at 29 West 39th St.), Chairman, W. H. Carrier, past-president, A. S. R. E.
Papers: (One by A. S. M. E.)
"The Effect Humidity of Heat Transmission of Galvanized Pipe," W. R. Woolrich, professor, University of Tennessee, Knoxville, Tenn.

7:00 p.m. A. S. R. E. Grand Jamboree (Grand Ballroom).
Music.
Dinner-Dance.
Cabaret.
Award of Student Prizes.

SATURDAY

10:00 a.m. Sixth Session — Chairman, Glenn Muffly, vice-president, A. S. R. E.
Refrigerators and Tests—Papers:
"Thermal Testing of Refrigerator Cabinets," H. W. Eagles, General Electric Co., Schenectady, N. Y.
"Testing Ice Refrigerators with the 'A.S.R.E.' and 'New York' Codes," C. R. Roe.
"The Protection of Refrigerator Insulation," Gale T. Pearce, sales manager, Dry Zero Corp., Chicago, Ill.
"Heat Behavior of Refrigerator Walls," J. L. Finck, physicist, Bureau of Standards, Washington, D. C., and M. S. Vandusen.

CASWELL-STULL, INC., GETS MICHIGAN FRANCHISE

Detroit, Mich. — Caswell-Stull, Inc., 6300 Cass Avenue, has taken over the state distribution franchise for General Electric refrigerators in Michigan. S. C. Caswell, formerly with the Monowatt Corporation of New York, and C. H. Stull, Grand Rapids, General Electric refrigerator distributor in western Michigan, purchased the outstanding stock in the McCormack-George Co., and formed the new company which bears their names.

The entire distribution for Michigan will be handled out of the Detroit headquarters on Cass Avenue, while the former quarters of the C. H. Stull Co., at 70 N. Division Ave., Grand Rapids, will be operated as a branch office.

No Other CONTROL

Combines So Many Outstanding Features Into One Compact Instrument as

PENN TYPE 'J' UNIT CONTROL

1. One Dial Control
2. Temperature Selector
3. Thermal Overload Protector
4. Start and Stop for Defrosting
5. Range and Differential Adjuster
6. Simplicity — Low Installation Cost

To further simplify your own domestic electric refrigeration, adopt Penn Type J Unit Control as standard equipment. Listed as Standard by the Underwriters Laboratories, and used by many of the largest and best known manufacturers in the industry. Write today for full information and standard control for test purposes.

PENN ELECTRIC SWITCH CO.
DES MOINES, IOWA

Manufacturers of Automatic Electric Controlling Devices adopted as Standard Equipment by many of the leading companies in the Electric Refrigeration and other industries.

OVER 100,000

people have asked for the interesting booklet

"What is DRY-ZERO?"

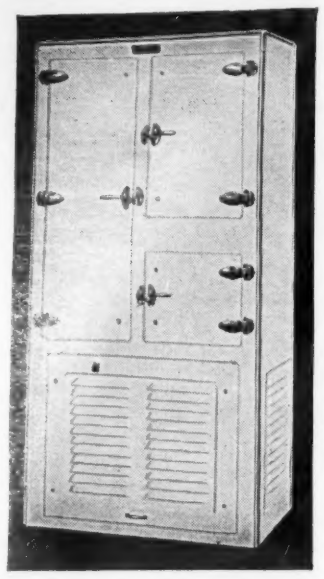
There's a free copy waiting for you!

DRY-ZERO CORPORATION, 130 NORTH WELLS STREET, CHICAGO, ILLINOIS

DRY·ZERO

THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

"It was built by BOHN"



The name BOHN is our warranty that the finest materials obtainable have been utilized by skilled craftsman and refrigeration engineers to build for you this beautiful and scientific product—an all-porcelain BOHN refrigerator.

BOHN installations include many of the leading hotels, restaurants and hospitals in America.

BOHN refrigerators are used exclusively on all Pullman-built railway dining and buffet cars.

The United States War Department has purchased hundreds of all-porcelain BOHN refrigerators for our army barracks and battleships.

In choosing BOHN refrigerators, discriminating home owners throughout the country have given BOHN a representative list of which any manufacturer might be proud.

The handy base cabinet may either be used for refrigerating machinery or the storage of cooking utensils, canned goods, vegetables, etc.

Write for details of the remarkably low prices that are now prevailing.

BOHN REFRIGERATOR COMPANY
SAINT PAUL, MINNESOTA

NEW PRODUCTS ROUND OUT KELVINATOR'S 1931 LINE

Detroit, Mich.—At the recent Kelvinator Distributors' Convention here, Sales Manager J. S. Sayre unveiled and explained a new domestic electric refrigerator model, the Yukon 7, which will be placed on the market immediately. The new model is a companion to the Yukon 5, introduced to the public a few months ago at the popular price of $159.50 f.o.b Detroit.

The Yukon 7 has all the improvements which were incorporated in the Yukon 5. It is 53½ inches high, 25¾ inches deep, 31 9/16 inches wide, and has a cubical food storage capacity of approximately seven feet. Shelf area is 12½ square feet. It has 2½ inches of insulation all around, and contains three ice trays, two with metal and one with rubber grid, with a total capacity of 81 large ice cubes, or 8¼ pounds of ice at a single freezing.

Interior finish is one-piece porcelain, with rounded corners; exterior is white lacquered enamel on rust-proof steel. Hardware is of special design, finished in Butler chrome.

It has a conveniently placed five-temperature setting dial and defrosting switch.

The new Kelvin Crisper is a very attractive accessory of the 1931 line. It is a porcelain enameled vessel, all white, with a black trim on its edge. Inside dimensions are 12½ inches long, 7 inches wide and 4 inches high. The Kelvin Crisper can be placed on any shelf or can be suspended on its cover beneath any shelf in the food storage compartment.

The four-way cold Frost Chest, a feature of the De Luxe and Standard cabinets, provides below freezing storage for meats, fish, fowl, or an extra supply of ice cubes.

On the entire Kelvinator line legs are now optional, but the new Yukon models come with the legs.

On the new De Luxe models tray fronts have been improved. These fronts will be of bright chrome finished metal, with pulls to match those on the machine compartment door.

A new name-plate, larger, and of attractive modernistic design, has been provided for the De Luxe cabinets. On this name-plate there is a large glass ruby jewel which catches the eye immediately. A switch at the top of the name-plate turns on and off the electric light which illuminates the interiors of the De Luxe cabinets.

The latest development in the commercial line is the dry system of cross fin cooling units. These meet a definite need in the commercial field which it would be difficult to meet with the flooded type. The dry system cross fin cooling units are especially adapted for small installations. The new dry system units will be used in connection with standard condensing units.

For 1931 the Kelvinator ice cream cabinet line ranges from one hole up to 12-hole models, including a line of portable two, three and four-hole models.

The Kelvinator water cooler line for 1931 includes all types, porcelain and other finishes, white and in colors. There are fountains, bubblers, coolers for bottles and several types that connect with city water supplies. The beverage bottle cooler, a recent addition to the line, is especially adapted for cooling soft drinks and milk. It is on casters and is easily portable for curb service.

REFRIGERATION ADDED TO PITTSBURGH'S CURRICULUM

Pittsburgh, Pa.—Starting in February, 1931, the second semester of the school year, the Department of Mechanical Engineering of the University of Pittsburgh, will offer an elective course in Household Refrigeration. The course will consist of two lecture periods and a three-hour laboratory period per week. The building and equipping of the laboratory has been in progress for some time and leading manufacturers of refrigeration equipment and accessories are represented.

The lecture course will cover the fundamental principles of refrigeration, together with a study of the mechanical design, construction, and operation of household units. The laboratory work will include the study of performance and testing of units and accessories.

In the laboratory, various research problems are also being handled at the present time. One very interesting problem in process deals with applying the refrigeration cycle to house heating. Assistant Professor F. H. Stiening of the Mechanical Engineering Department is in charge of this work at the University.

NEW ELECTRO-KOLD SETUP FOR STATE OF MONTANA

Butte, Mont.—The Sullivan Valve & Engineering Co., 910 South Arizona St., has taken over the distribution of Electro-Kold refrigeration for the state of Montana.

Previously the Electro-Kold Corporation sold direct to its Montana dealers. Under the new arrangement, the Sullivan Company will retail through its Butte outlet and distribute to the balance of the Electro-Kold dealer organization in the state.

SALES BY DOHERTY CO. PASS 7,000 UNIT MARK

New York, N. Y.—At the end of the third quarter, domestic and commercial refrigerator sales by the subsidiaries of H. L. Doherty & Co. totaled 7,206 units. During the month of September the Doherty men added 520 more sales to their year's total.

To surpass the mark set during 1929, the subsidiaries will have to sell 1,568 refrigerators during the last quarter. In 1929, the companies, through hard selling effort and intensive drives, boosted sales up to the 8,774 unit mark.

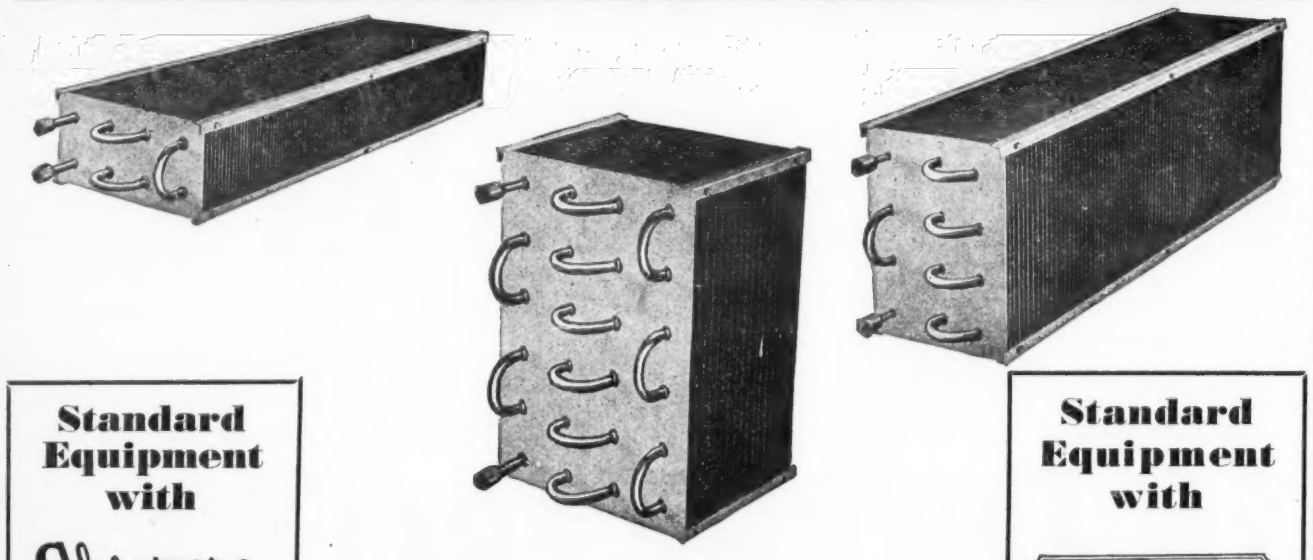
So far this year, the Ohio Public Service Group is setting a fast pace, having sold 1,879 refrigerators during the nine-month period. Toledo Edison Co. is in second place with 1,455 sales. Sales in various cities where Doherty subsidiaries are operating are as follows:

	September	*Year to Date*
Adrian	2	93
Bristol	12	156
Danbury	17	228
Durham	42	242
Elizabethton	3	114
Erwin	1	36
Johnson City	14	163
Joplin	20	391
Sedalia	6	37
St. Joseph	29	502
Toledo	153	1,455
Toledo—Defiance	5	67
Toledo—Lake Shore	..	45
Toledo—Michigan	..	19
Ohio Public Service	74	1,879
Alliance	4	118
Ashland	4	132
Elyria	7	195
Lorain	8	224
Mansfield	17	213
Massillon	12	288
Port Clinton	2	86
Sandusky	10	267
Warren	10	356
Public Serv. of Colorado	142	1,779
Alamosa	11	132
Boulder	1	94
Brighton	3	20
Cheyenne	2	52
Denver	114	1,153
Fort Collins	3	60
Grand Junction	3	134
Idaho Springs	2	18
Leadville	1	14
Salida	2	41
Sterling	..	61
Total	520	7,206

McELHANEY AND BRUNTON FORM SERVICE COMPANY

Huntington, W. Va.—Two pioneer refrigeration men, Roy McElhaney and Claude A. Brunton, have disposed of their interests in the Kelvinator franchise for this territory and have formed the Mechanical Refrigeration Service Company. Messrs. McElhaney and Brunton have represented Kelvinator for about seven years in Huntington.

The new company will specialize in service and engineering work and no attempt will be made to merchandise electric refrigerators. A recent survey shows that there are from twelve to fifteen hundred mechanical refrigerators of various makes in use in the city of Huntington. In addition to refrigerators, the company will render service on all types of home electrical appliances.



93 Standard Stock Sizes

NATIONAL recognition and acceptance of LARKIN patented COILS by leading manufacturers has lead to the greatest most complete line ever available with 93 standard stock sizes.

This tremendous growth is due to the remarkable tested and retested performance of LARKIN 100% Vertical Surface Aluminum Plate COILS wherein all claims were carefully proven. These Coils *positively* eliminate dehydration and defrosting problems solving the servicing problems because they are constantly efficient.

Detailed information from any manufacturer listed here or direct from the originators and manufacturers.

Standard Equipment with

Absopure DETROIT, MICH.
B-K, Junior New Brunswick, N.J.
Copeland DEPENDABLE Electric Refrigeration DETROIT, MICH.
WILLIAMS ICE-O-MATIC REFRIGERATION BLOOMINGTON, ILLINOIS
JACK FROST REFRIGERATION Ltd. TORONTO-CANADA
KULAIR PHILADELPHIA, PA.
M&E Electric-Automatic REFRIGERATOR PHILADELPHIA

Standard Equipment with

Modern BELLEVILLE, ILLINOIS
POTTER PORTLAND, O.
SERVEL Electric Refrigeration
TRUPAR DAYTON.—OHIO
UNIVERSAL DETROIT, MICH.
Wayne FORT WAYNE, IND.
Zerozone Lifetime Refrigeration

100% VERTICAL SURFACE

LARKIN COILS FOR ELECTRICAL REFRIGERATION

LARKIN COILS are covered by U. S. Patent 1,776,235 and it is the intention of the manufacturer to protect its patent rights.

LARKIN-WARREN REFRIGERATING CORPORATION
ATLANTA *Originators and Manufacturers* GEORGIA

Outwitting the Moth

Vicksburg, Miss.—An unusual installation of Copeland refrigeration equipment was made recently by the Feltus Sales Company, Copeland dealers here, for the fur storage department of the Vicksburg Laundry and Cleaners. A room 14 ft. by 18 ft. by 10 ft., with a capacity of several hundred fur coats, is cooled by Copeland.

In accordance with U. S. Government Bulletin on Fur Storage Facilities, this room is kept at a 40 degree constant temperature, necessitating the operation of the two Model X 1200 compressors approximately 50 per cent of the time. On test the expansion valves were opened on the coils (Larkin-Warren No. 1210) and the room was kept at a 28 degree temperature for twenty-four hours.

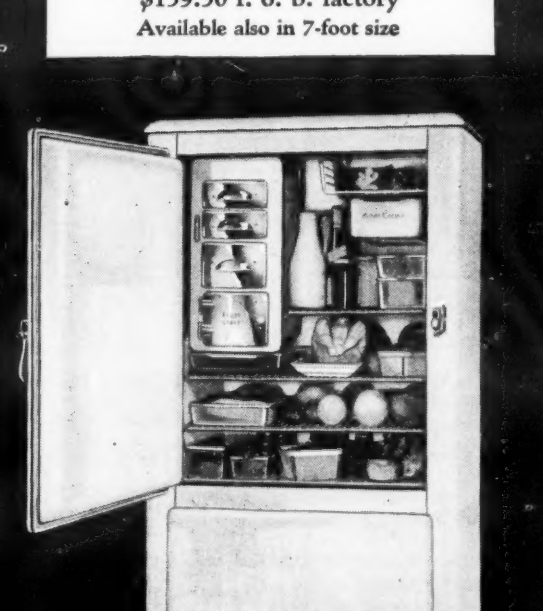
The fur storage idea has proved profitable to the Vicksburg Laundry and Cleaners, and before next summer the room is to be enlarged to twice its present capacity.

The Crowning Achievement of 17 Years of Leadership

KELVINATOR FOR 1931

The Kelvinator Yukon Model
$159.50 f. o. b. factory
Available also in 7-foot size

The Kelvinator Standard Model
$210.00 f. o. b. factory, upwards
Available in 3 sizes—4, 5 and 7-foot



The Kelvinator De Luxe Model
$360.00 to $755.00 f. o. b. factory
Available in 6-8-11-14-22-foot sizes

Kelvinator engineering leadership has always given Kelvinator representatives the *most salable merchandise* in the Industry.

The remarkable new Kelvinator Line for 1931 gives Kelvinator merchants an even greater advantage. Now, more than ever, the Kelvinator Franchise is the biggest opportunity in the most promising and the fastest growing industry today.

Kelvinator has always been the leader, but never has there been such a wealth of engineering features as you will find in the 1931 line. Never has there been so much to talk about, so many notable sales features that mean greater volume and greater profits.

The new 5-foot Yukon, priced at $159.50 f. o. b. factory, brings Kelvinator *quality* and *value* to the low-price buyer. From the consumer's standpoint, it is the outstanding low-price electric refrigerator today. It has many noteworthy features; can be attached to any electric light socket; is remarkably quiet; and can easily be moved from place to place. From the dealer's standpoint, it represents an unparalleled opportunity. The dealer has no service problems, no parts inventory, nor large stock of cabinets. The Yukon is "over-the-counter" merchandise and the profit on every sale is *clear profit.*

The Kelvinator Standard and De Luxe Models for 1931 are the greatest achievements of a group of engineers who have made refrigeration history.

Such notable features as World's Fastest Freezing, with the Iso-Thermic Tubes; the Frost Chest; the Kelvin Cooler and the Kelvin Crisper; porcelain interiors and exteriors; polished chrome tray fronts; Flexo trays; the distinctive Kold Keeper; Kelvatex insulation; and the exclusive Kelvinator fully *automatic* 4-Way Cold give the new 1931 Kelvinator models a preeminence that assures record-breaking sales and profits for Kelvinator distributors and dealers during the coming year.

A new high record for Kelvinator domestic business was established in 1929. The year 1930 was 31% ahead of 1929. Now, with these three great new models and a complete line of commercial equipment for every refrigeration need, backed by an aggressive advertising and sales promotion program, Kelvinator looks forward to the *greatest year in its history.*

Refrigeration dealers, radio dealers, and dealers in other lines who are looking for a profitable and permanent business investment are invited to write us for details about the Kelvinator Line and the *Kelvinator Opportunity in 1931.*

KELVINATOR CORPORATION
14245 Plymouth Road, Detroit, Michigan
Kelvinator of Canada, Limited, London, Ontario
Kelvinator Limited, London, England

COUPON

KELVINATOR CORPORATION,
14245 Plymouth Road, Detroit, Michigan.
Gentlemen:
I am interested in the Kelvinator Franchise. Please send me complete information.

Name_____
Street Address_____
City_____ State_____
(160)

ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

Published Every Two Weeks by

BUSINESS NEWS PUBLISHING CO.

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VOL. 5, NO. 6, Serial No. 108, Part 1 — November 19, 1930

All Set To Go

ANNOUNCEMENT of definite plans for accomplishing the sale of 1,000,000 domestic refrigerators in 1931, brings assurance that the recently created Electric Refrigeration Bureau of the National Electric Light Association has squared away for an aggressive campaign.

The plan calls for the enthusiastic co-operation of every company and organization concerned in the manufacture and sale of refrigerators with the utility companies which are directly interested in the performance of the refrigerator after it is in the possession of the purchaser. Only by such co-operation at every step can success be made certain. Nationally and locally, those interested in any way in the advancement of electric refrigeration must pool their efforts and work in unison.

As the business newspaper of the electric refrigeration industry, the publication that makes contact with more men in the various ramifications of the industry than any other medium, the NEWS feels safe in promising that this industry will do its part, and carry on with a spirit that may possibly surprise those in general charge of the three-year program.

Refrigeration men will ask only one thing: that every possible means be employed to keep them in close touch with what is going on. The utmost willingness to co-operate is of little value if full knowledge of what is desired is not readily available. The division of the country into twelve districts, or regions, proves that the Electric Refrigeration Bureau is alive to the necessity of a measure of decentralization of effort. The refrigeration army is a big one. To exert its full power it must be adequately trained and equipped.

A Splendid Opportunity

THAT invaluable organization, the American Society of Refrigerating Engineers, will hold its semi-annual meeting in New York December 3, 4, 5 and 6. An excellent program, which is printed on another page, has been arranged, and the meeting seems certain to be one of the most successful in the Association's history.

Conventions of technical societies like the A. S. R. E. are of great benefit to industry. They give the engineers and other technical men a chance to get together on a common footing and review the progress of the industry. They offer to industry executives an opportunity to gain a better acquaintance with the men from the engineering workrooms and laboratories. To the younger men especially they provide a means of acquiring first-hand information and making contacts which are of lasting value.

As is usual in the case of meetings and conventions of an educational nature, the railroads are offering reduced rates to those who go to New York for the A. S. R. E. sessions. Everything is being done by those in charge of the meeting to make the stay of every man and woman who attends a pleasant one.

The A. S. R. E. belongs to the refrigeration industry. Let the men of the industry do their part to further its success.

Promoting the Code

JUST what method will prove most effective in presenting the Standard Refrigeration Safety Code to the municipalities of the United States is a matter of doubt. With commendable enterprise the American Society of Refrigerating Engineers has made copies available to all who desire them at a nominal price, and it is to be hoped that many of these printed copies of the Code will find their way into the hands of city officials and others charged with the duty of municipal legislation.

The refrigeration industry can do a great deal to spread the news of the adoption of the Code among those who should know about it. Refrigeration sales organizations are working actively in every city and town, and it will be a simple matter for them to step in when codes are being discussed and at least commend the Standard Code to the consideration of the city fathers.

The Code has been approved in its present form by practically every element in the refrigeration industry. The industry has a splendid opportunity to show that, collectively and individually, it stands behind that approval.

On the Pacific Coast

EXHIBIT of Holbrook refrigerators manufactured by Holbrook, Merrill & Stetson of Los Angeles and San Francisco at the recent California State Fair at Sacramento. The Nu-Way display case shown in the photograph is a product of one of the H., M. & S. subsidiary companies which they have recently taken over.

REFRIGERATOR IS HAILED AS A SUPER SALESMAN

Cleveland, Ohio—The electric refrigerator was hailed as a super salesman for central station service by speakers at the Central Station Merchandising Executive Conference held in Refrigeration Institute, November 6-7, and attended by 100 utility representatives from every section of the country.

Speaking on the subject, "The Super Salesman for Central Stations," P. B. Zimmerman, general sales manager, electric refrigeration department, General Electric Company, who served as chairman of the conference, declared that the company is set up to increase its 1931 refrigerator sales by at least 25 per cent over 1930 sales. He pointed out that up to November 1st the sales of General Electric refrigerators were 30 per cent ahead of the same period for last year.

"The electric refrigerator is a super salesman of central station service for various reasons," he said. "The public utilities cannot afford to sponsor any service that does not add to its good will. The utility is not judged by the excellence of its electric current but by the instruments of its service.

"Because it brings a new service to you at a lower cost, the refrigerator represents, in effect, a new customer. It has been estimated that each new customer of an electric light and power company necessitates an investment of $200, but through placing one electric refrigerator upon your lines, without any further investment on your part, you have another customer. The average light bill in our country per year is $30. The average electric refrigerator builds an additional annual revenue of the same amount. Even if the adding of an electric refrigerator to your lines cost one dollar, it would be the cheapest load you ever added.

"The electric refrigerator has stood the test of time payment. We have now something like 40 to 50 million dollars in time payment paper, and it is the soundest thing upon our books."

Big Figures Quoted

It was estimated at the conference that two hundred and forty million additional kilowatt hours will be added to the lines of the electric light and power companies of this country in 1931 by General Electric refrigerators.

The desire for electric refrigerators is being extended to the smaller communities and to the rural districts, according to G. W. Allison, another conference speaker. Dr. Allison is head of the new organized electric refrigeration bureau of the National Electric Light Association, which has for its purpose the sale of one million refrigerators annually for the next three years.

"As to selling activities on the part of the utility companies," Dr. Allison said, "the refrigerator means more than merely an increase in revenue. It has many by-products and sometimes the by-products are more valuable than the revenue. In the case of electric refrigerator the by-products of good-will cannot be emphasized too much."

The result of the conference was summed up by Manager T. K. Quinn, who declared that the first aim of the General Electric Company was to build a quality refrigerator.

Among visiting speakers on the program were: V. H. Moon, of the Pacific Power & Light Company, Portland, Ore.; A. E. Wood, of the Associated Gas & Electric System, New York; C. V. Sorenson, of the Indiana Electric Corporation, Indianapolis; Thos. F. Kennedy, of the Henry L. Doherty Company of New York; R. M. Bleak, of the Utah Power & Light Company; Wm. Very, of the Philadelphia Electric Company; R. W. Hoy, of the Pennsylvania Power & Light Co.; L. M. Williams, of the Wisconsin Power & Light Company; G. B. Richardson, of the Texas Power & Light Company; F. M. Houston, of the Rochester Gas & Electric Company; Carl Brown, of the Georgia Power Company; E. L. Hinchcliff, of the Middle West Utility Company; Geo. Whitwell, of the Duquesne Light Company; and A. R. Stevenson, Jr., of the General Electric Company, Schenectady, N. Y.

The conference was opened by H. H. Bosworth, manager of the central station division of the Electric Refrigeration Department, who stressed the importance of merchandising activities of the public utility companies in the promotion of electric refrigeration.

Advertising Means Power

The power which advertising and sales promotion plays in selling today was discussed by Walter J. Daily, sales promotion manager, who declared that there is money available today if people can be induced to part with it. Advertising, he said, is a great force in presenting arguments as to why people should purchase electric refrigerators.

A. C. Mayer, of the merchandising division; Edwina Nolan, home service director; J. J. Donovan, apartment house division; W. E. Landmesser, commercial division; W. M. Timmerman, commercial engineer; and A. M. Sweeney, assistant to Manager Quinn, discussed various phases of the selling problem as it affects public utilities.

All who attended the two-day meeting were enthusiastic about the prospects for increased refrigerator sales in 1931. They returned to their home organizations with plenty of sales ammunition.

Those present were:

Dorsey Hines, N. K. Ovalle, C. G. Neff, C. C. Robinson, A. F. Ayala, H. I. Boggs, Clarence Wheeler, George Patterson, C. J. Enderle, Mark Wright. J. M. Walker, H. W. Kumler, J. De Jen, Dan Willis, H. G. Bogart, Jr., L. A. Kline, J. A. Rafferty, T. O. Kennedy, R. M. Bleak, M. G. Sanders, Frank M. Houston, V. H. Moon, H. H. Bosworth, P. B. Zimmerman, R. W. Hoy, A. C. Mayer, Jos. W. Busch, O. A. Acuff, James M. Patten, L. T. White, Paul H. Dow, J. E. Fanning, T. F. Kennedy, O. P. B. Johnson, Lawrence Jennings, C. A. Turner, George W. Allison, E. M. Cobb, C. J. Prashaw, D. W. Maupin, A. J. Bradley, H. H. Davis, R. S. Bell, J. T. Schilling, A. C. Storz, E. F. Schmidt, Robt. L. Hughes, J. Frank Small, C. W. Brainard, Stanley Jenks, Geo. Whitwell, J. C. Thompson, W. V. Archibald, H. J. Jenkins, A. E. Ward, W. G. Keay, J. C. Young, Jr., Wm. Parkerson, J. C. McCoy, R. E. Sivley, L. D. Wittkower, E. L. Hinchcliff, Geo. Fuller, J. P. Walters, E. G. Cloud, C. V. Sorenson, F. J. Cottrill, E. R. Felber, Wm. T. Reace, H. A. Keys, H. J. Von Neida, A. P. Bryant, R. F. Judd, F. A. Wentworth, T. E. Roach, R. Ellsworth, C. F. March, R. J. Chapman, D. M. Halleck, H. H. Parrett, S. A. Hall, Hugh L. Smith, E. E. Hoyt, Wm. M. Very.

LIVE AND PROGRESSIVE

"Want to say that the NEWS is certainly a most interesting, live and progressive journal."—H. C. Frierson, Winter Haven, Fla.

MEMPHIS CORDIAL HOST TO PRACTICAL ENGINEERS

Memphis, Tenn.—The much famed southern hospitality was in evidence when the National Association of Practical Refrigerating Engineers convened at the Hotel Peabody here, November 11-14. Long technical sessions were interspersed in a merry round of social activities which were planned by the Memphis chapter of the organization. The climax of the convention was the annual banquet and dance at the Peabody, Wednesday evening, at which the engineers, their wives and friends, enjoyed the frolic.

At the Wednesday afternoon session, the engineers heard E. Prestage, of London, England, tell about his sleeve valve compressor which he has manufactured since 1924. Interesting installations of this type of compressor in England and other foreign countries were shown by Mr. Prestage. While in this country, Mr. Prestage plans to interest American manufacturers in his product.

Emmett T. Quinn, of Los Angeles, also read his $200 prize-winning paper, "Practical Method of Varying the Capacity of Ice Manufacturing Plants to Meet the Load Conditions in an Economical Manner," at this session. Power contracts, lubrication and rebuilding ice plants were other subjects which also came up for discussion at the Wednesday session.

The meeting closed with a general session on Friday afternoon, although the executive committee met on Saturday.

KELVINATOR PROTESTS DUPLICATION OF NAME

KELVINATOR CORP.
14250 Plymouth Rd.
Detroit, Michigan

November 1, 1930.

F. M. Cockrell, Publisher,
Electric Refrigeration News,
550 Maccabees Bldg.,
Detroit, Mich.
Dear Mr. Cockrell:

It has been noted that the ELECTRIC REFRIGERATION NEWS of October 8, 1930, carried an item regarding the activities of a concern called Benedict & Company, Ltd., having a place of business at 2867 Pico Street, Los Angeles, Calif., and which concern is alleged to have commenced the production of an electric refrigerator under the name "Yukon."

Inasmuch as Kelvinator Corp. and its predecessors in business have sold both ice and electrically operated refrigerators under the name "Yukon" for a great many years, it is thought that the attention of the ELECTRIC REFRIGERATION NEWS should be called to the fact that there is no connection whatever between the California concern of Benedict & Co. and Kelvinator Corp. of Detroit, Mich., and that the "Yukon" model Kelvinator is manufactured and sold only by the latter.

Yours very truly,
By L. D. BURCH,
Patent Dept.

TRUPAR SELLING WELL IN OMAHA TERRITORY

Omaha, Neb.—The Baker Manufacturing Co., Omaha, reports selling 110 Trupar electric refrigerators this season. The Baker Mfg. Co. is strictly wholesale and finds the biggest market with retail plumbers in Nebraska and western Iowa.

WINSTON PAUL RETIRES AS FRIGIDAIRE DISTRIBUTOR

(*Concluded from Page 1, Column 2*)

division, was declared winner of the contest. He did the remarkable job of selling 1,052 per cent of his quota. In bidding his organization farewell recently, Mr. Paul said:

"Nine years ago, when Domestic Electric Co. undertook the sale of Frigidaire, an electric refrigerator was considered an unreliable experiment; the cheapest Frigidaire was $655 delivered, and that first month we were in the Frigidaire business—July, 1921—we sold only five jobs the entire month. This past July we sold 7,010 Frigidaires.

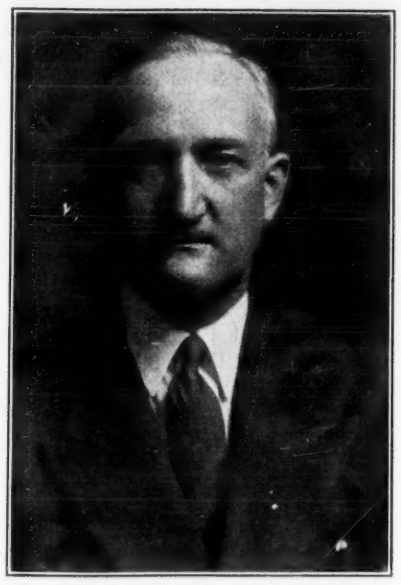
"The Domestic Electric Co. is the largest distributor of mechanical refrigeration in the world—and by a wide margin. In the past two years our sales have been in excess of 109,000 units. Our gross billings for the past year were a shade under $19,000,000. This company has 680 employees on its direct payroll, and its dealers and their employees number 647, a total of 1,327.

"It has been my practice in meetings of this kind to comment briefly on current business conditions. Very briefly I want to register my emphatic protest at the too prevalent habit today of many people to complain about present business conditions. Because someone's individual business does not match up with the record-breaking year of 1929, he complains that the bottom has dropped out of things. I have in my hand a compilation of dividends paid for the nine months of 1929 against a similar period of 1930. For the first nine months of this year an amazing sum has been paid out in cash dividends by corporations of this country amounting to $3,621,000,000 against $2,395,000,000 a year ago, or an increase of 50%. This means that there is available for purchases in this country 50% more cash than a year ago. This is a constructive factor of paramount importance—and this is quite borne out in our experience. It may interest you to know that for the past quarter, namely, July, August and September, the number of Frigidaires sold by us, i. e., orders booked, exceeded the same period of a year ago by 11½%, and the same three months of 1928 by 76.8%.

"I thank you for the support, loyalty and industry in which, almost without exception, each one of you has performed your work. I am happy I have been able to recommend to the Frigidaire Corporation, without qualification, the continuance of each and every salesman, dealer and employee. I now ask you to continue the same effort and loyalty to the Frigidaire Corporation. This should not be difficult for you will be working in the same manner, for the same objects, and for the same flag or standard, even though your former standard-bearer and leader may be gone."

Among the guests at the dinner were: H. Simmers, service manager, Frigidaire, New York; G. P. White, auditor, Frigidaire, New York; H. C. Baker, distributor, Frigidaire, Roanake, Virginia; Ray Fox, manager, General Motors Acceptance Corporation Branch, New York; H. C. Gilbert, distributor, Frigidaire, Rochester; R. E. Smithson, Frigidaire, Dayton; F. C. Horner, General Motors Corporation; E. E. Levy, distributor, Frigidaire, Chicago; H. W. Newell, distributor, Frigidaire, Boston; W. M. Walsh, merchandising manager, Connecticut Light and Power; William T. McIntyre, Dominick and Dominick; R. F. Trant, distributor, Frigidaire, Norfolk, Virginia; G. A. Ames, General Motors Acceptance Corporation; C. A. Barton, New York and Queens Electric Light and Power Company; F. H. McDonald, distributor, Frigidaire, Miami, Florida; Albert Bradley, vice-president, General Motors Corporation; J. A. Rovensky, Bank of America; Clarence Law, New York Edison Company; L. McCutcheon, sales manager, Frigidaire, New York; C. F. Kettering, vice-president, General Motors Corporation; John L. Pratt, vice-president, General Motors Corporation; C. M. Eakin, manager, Frigidaire, New York; B. B. Geyer, president, Geyer Company, Dayton, Ohio; J. K. Knighton, Eastern regional manager, Frigidaire, New York; Inglis M. Uppercu, Uppercu Cadillac Corporation, New York; W. O. Waldsmith, distributor, Frigidaire, St. Louis; Mrs. Winston Paul; H. N. Kinnee, distributor, Frigidaire, Buffalo; Mrs. Marie M. Maloney, director of the Herald-Tribune Institute; Mrs. Elizabeth Stone Macdonald, director, Consumer Research Department, Frigidaire, Dayton; T. A. Reynolds, vice-president, National City Bank; R. D. Funkhouser, vice-president, Frigidaire Corporation; C. L. Harold, Brooklyn Edison Company; E. R. Early, O'Brien, Boardman, Conroy, Menhard and Early; W. J. Swyers, general manager, National Refrigeration Company, Frigidaire distributor, Buffalo; Ira G. McCreery, vice-president, General Motors Acceptance Corporation; F. M. Cockrell, publisher, Electric Refrigeration News; C. T. Mutchner, Geyer Company, Dayton; M. E. Cutler, Frigidaire, New York; J. P. Radcliffe, Jr., Yonkers Electric Light and Power Company; Harry Williams, Frigidaire, Dayton.

Branch Manager



C. M. Eakin

UTILITY EMPLOYES FETED BY FRIGIDAIRE BRANCH

New York, N. Y.—Some 800 employes of the New York Edison Co., United Electric Light & Power Co., Brooklyn Edison Co., New York and Queens Electric Light & Power Co., and Yonkers Electric Light & Power Co., were banqueted November 13 at the Hotel Astor by the New York sales branch of the Frigidaire Corporation.

Held in connection with President Matthew S. Sloan's campaign to enlist the aid of New York utility employes in selling electric refrigerators, this dinner was given to establish good will and felicitous mutual relations between the two organizations.

Among the speakers were E. G. Biechler, president of Frigidaire; Mr. Sloan, "Senator" Ford, humorist and entertainer, and various power company officials. Among the guests were representatives from the New York Copeland, Kelvinator and General Electric organizations.

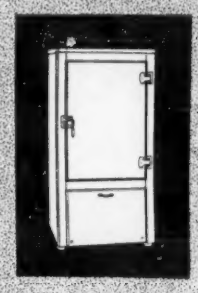
WESTINGHOUSE INCREASES FACTORY SPACE

Springfield, Mass.—An up-to-date building more than 600 feet long, formerly used for radio production, is being equipped by the Westinghouse Electric & Manufacturing Company for manufacturing its new line of electric refrigerators for apartment house use. It is planned to produce these at the rate of 200 a day, starting January 1. The refrigeration engineering department, moved here from Mansfield, O., has its offices in the administration building.

COOPERATIVE SALES PLAN SETS MILLION AS GOAL

(*Concluded from Page 1, Column 5*)

Jan. 15—Field men available for contacting local committees.
Feb. 2—Local plan completed.
Feb. 16—Co-operative Electric Refrigeration Exhibit.
Mar. 2—Plans for spring campaign completed.
Mar. 28—First national advertisement appears.
Apr. 1—Local spring campaign begins.
Apr. 11—Second national advertisement appears.
Apr. 25—Third national advertisement appears.
May 9—Fourth national advertisement appears.
May 23—Fifth national advertisement appears.
June 13—Sixth national advertisement appears.
June 27—Seventh national advertisement appears.
July 1—Plans for fall campaign completed.
July 25—Eighth national advertisement appears.
Sept. 5—Ninth national advertisement appears.
Sept. 7—Electric Refrigeration Week —Local fall campaign begins.
Sept. 19—Tenth national advertisement appears.
Oct. 1—Plans for Christmas campaign completed.
Oct. 3—Eleventh national advertisement appears.
Nov. 14—Holiday sales national advertisement appears.
Nov. 16—Local Christmas campaign begins.
Dec. 5—Christmas national advertisement appears.



Built to last...REX Cabinets are an asset to every unit manufacturer. Their sound design, sturdy construction and beautiful appearance are evident values that represent superior craftsmanship. Just write for particular information.

REX will be glad to serve you.

Rex

Rex Manufacturing Co., Inc.
Connersville, Indiana

FLINTLOCK
CONDENSERS
Full Capacity

With Every Unit

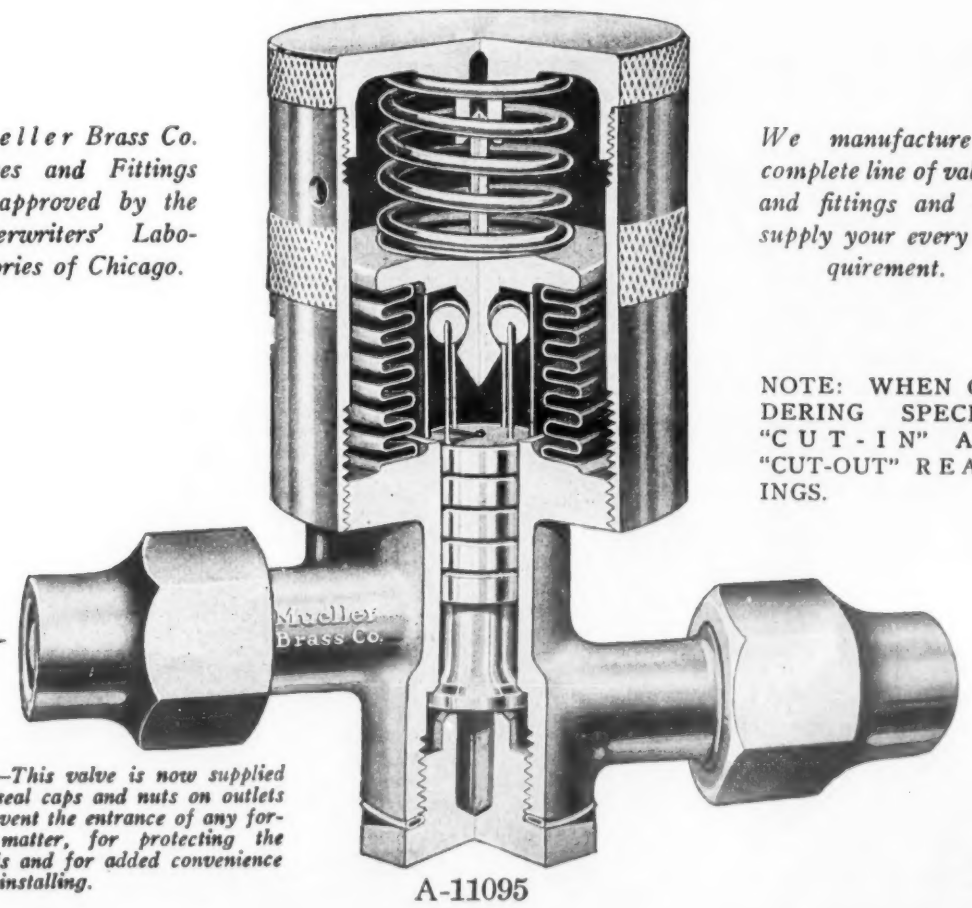
FIN AND TUBE SAME SOLID PIECE OF MATERIAL

FLINTLOCK CORPORATION
4461 W. Jefferson Ave.
DETROIT, MICH.

Sulphur Dioxide!
For Direct Charging
Every Container Analyzed
"Pure" Bone Dry . . . . Cylinders 2 to 150 lbs
ANSUL Chemical Co. MARINETTE, WIS
Also . . . . Ton Drums-Tank Cars

MUELLER
Two-Temperature Control
SNAP VALVE

Mueller Brass Co. Valves and Fittings are approved by the Underwriters' Laboratories of Chicago.



We manufacture a complete line of valves and fittings and can supply your every requirement.

NOTE: WHEN ORDERING SPECIFY "CUT-IN" AND "CUT-OUT" READINGS.

Note—This valve is now supplied with seal caps and nuts on outlets to prevent the entrance of any foreign matter, for protecting the threads and for added convenience when installing.

A-11095

This valve is so constructed as to make it a real aid to the service man. By merely turning the outside knurled case he can raise or lower the temperature without danger of losing the differential which was previously properly set.

The differential is built into the valve and cannot be changed.

The temperature range may be changed without the necessity of a recheck or numerous visits of the service man.

Simplicity of construction insures a long and trouble proof life.

The snap action feature prevents seat erosion and assures uniform performance.

The body is a brass forging, thus making it seep proof and free from defects.

Mueller Brass Co.
PORT HURON, MICHIGAN
THREE GENERATIONS OF BRASS MAKING

Standard Safety Code For Mechanical Refrigeration

CONTENTS

Section I—Definitions.
Section II—Classification of Refrigerating Systems.
Section III—Industrial and Commercial Systems.
Section IV—Unit Systems.
Section V—Apartment Dwelling Systems.

Each section is complete in itself except where reference is made to other sections.

SCOPE: This code applies to the safe installation, operation, and inspection of every refrigerating system hereinafter installed employing a fluid, which is expanded, vaporized, liquefied and/or compressed in its refrigerating cycle.

PURPOSE: This code is intended to provide reasonable safety for life, limb, health and property.

SECTION I

DEFINITIONS

100: "AIR CONDITIONING SYSTEM": A refrigerating system for the purification and/or control of temperature and/or humidity of air.

101: "APARTMENT DWELLING SYSTEM": A refrigerating system employing the "Direct Method" (Par. 109) in which the refrigerant is delivered by a pressure imposing element to two or more evaporators in separate refrigerators or refrigerated spaces located in rooms of separate tenants in multiple residence buildings.

102: "APPROVED": Official approval by the authority having jurisdiction.

103: "BRINE": Any liquid cooled by the refrigerating system and used for the transmission of heat.

104: "BRINE COOLER": An evaporator for cooling brine in an indirect system (Par. 116).

105: "CHECK VALVE": A valve allowing refrigerant flow in one direction only.

106: "COMMERCIAL SYSTEM": A refrigerating and/or air conditioning system except unit systems (Par. 137) used in a commercial and/or a business place, such as a meat market, store, florist shop, hotel, office buildings, restaurant, candy shop, bakery, and other commercial enterprises, assembled and installed in the manufacturing and/or business portion of any building.

107: "CONDENSER": A vessel or arrangement of pipe or tubing in which the vaporized refrigerant is liquefied by the removal of heat.

108: "CONTAINER": A cylinder for the transportation of refrigerant constructed to conform to the regulations of the U. S. Interstate Commerce Commission.

109: "DIRECT METHOD OF REFRIGERATION": A system in which the evaporator is located in the material or space refrigerated or in air circulating passages communicating with such space.

110: "EMERGENCY RELIEF VALVE": A manually-operated valve for the discharge of refrigerant in case of fire or other emergency.

111: "EVAPORATOR": That part of the system in which a refrigerant is expanded or vaporized to produce refrigeration.

112: "EXPANSION COIL": An evaporator constructed of pipe or tubing.

113: "FLAMMABLE REFRIGERANT": Any refrigerant which will burn when mixed with air, such as ethyl chloride, methyl chloride and the hydro-carbons.

114: "FUSIBLE PLUG": A device having a predetermined temperature, fusible member for the relief of pressure.

115: "HYDROCARBON REFRIGERANT": A refrigerant containing only hydrogen and carbon, as ethane, propane, isobutane and butane.

116: "INDIRECT METHOD OF REFRIGERATION": A system in which a liquid as "brine" or water, cooled by the refrigerant, is circulated to the material or space refrigerated or is used to cool air so circulated.

117: "INDUSTRIAL SYSTEM": A system used in the manufacture or processing of materials, such as in ice-making plants, cold storage warehouses, ice cream plants, dairy plants, packing houses, chemical plants and other of similar industrial enterprises.

118: "IRRITANT REFRIGERANT": Any refrigerant which has an irritating effect on the eyes, nose, throat, or lungs, as ammonia and sulphur dioxide.

119: "LIQUID RECEIVER": A vessel permanently connected to the high pressure side of a system for the storage of refrigerant.

120: "MACHINERY ROOM": A separate room for the housing of any pressure imposing element, condenser, receiver, or shell type apparatus.

121: "MIXER": A vessel or device for mixing the refrigerant with another substance.

122: "MULTIPLE SYSTEM": See Apartment Dwelling System.

123: "PRESSURE IMPOSING ELEMENT": Every device or portion of the equipment used for the purpose of increasing the pressure upon the refrigerant.

124: "PRESSURE LIMITING DEVICE": A pressure- or temperature-responsive mechanism for automatically stopping the operation of the pressure imposing element at a predetermined pressure.

125: "PRESSURE RELIEF DEVICE": A pressure relief valve, a rupture member, a fusible plug or other approved device for relieving pressure.

126: "PRESSURE RELIEF VALVE": A valve held closed by a spring or other means, which automatically relieves pressure in excess of its setting.

127: "PRESSURE VESSEL": Any refrigerant containing receptacle of a refrigerating system other than expansion coils, headers and pipe connections.

128: "PUBLIC BUILDINGS, BUSINESS BUILDINGS, RESIDENCE BUILDINGS, APARTMENTS" are buildings as defined by (insert here section and name of state or municipal regulations).

129: "REFRIGERANT": A substance used to produce refrigeration by its expansion or vaporization.

130: "REFRIGERATING SYSTEM": A combination of parts in which a refrigerant is circulated for the purpose of extracting heat.

131: "RUPTURE MEMBER": A device which will automatically rupture at a predetermined pressure.

132: "SEALED UNIT": A pressure imposing element which operates without stuffing-box and/or which does not depend upon contact between moving and stationary surfaces for refrigerant retention.

133: "SERVICE VALVE": A key-operated shut-off valve in Class C, D and E systems (Par. 203, 4, 5) intended for use only during shipment, installation, or repair.

134: "SHELL TYPE APPARATUS": A refrigerant containing pressure vessels having tubes for the passage of a cooling or a refrigerating fluid.

135: "SLEEPING ROOM": (a) Any room built, used or equipped for sleeping purposes:

(b) Any room, combination of interconnecting rooms, alcoves, or niches not separately ventilated to the outside used for living purposes, including sleeping and having a total volume of four thousand (4000) cubic feet or less. By interconnecting rooms is meant adjoining rooms within the jurisdiction of a single tenant which can be closed off by doors.

136: "STOP VALVE": A shut-off valve other than a service valve for controlling the flow of refrigerant.

137: "UNIT SYSTEM": A system which can be removed from the users' premises without disconnecting any refrigerant containing parts.

SECTION II

CLASSIFICATION OF REFRIGERATING SYSTEMS

200: Refrigerating system shall be classified according to the total weight of refrigerant contained in or required for their proper operation.

201: A Class "A" system is one containing one thousand pounds (1000 lbs.) or more of refrigerant.

202: A Class "B" system is one containing more than one hundred pounds (100 lbs.) but less than one thousand pounds (1000 lbs.) of refrigerant.

203: A Class "C" system is one containing more than twenty pounds (20 lbs.) but not more than one hundred pounds (100 lbs.) of refrigerant.

204: A Class "D" system is one containing more than six pounds (6 lbs.) but not more than twenty pounds (20 lbs.) of refrigerant.

205: A Class "E" system is one containing six pounds (6 lbs.) or less of refrigerant.

SECTION III

INDUSTRIAL AND COMMERCIAL SYSTEMS

A system used in the manufacture or processing of materials, such as in ice-making plants, cold storage warehouses, ice cream plants, dairy plants, packing houses, chemical plants and other industrial enterprises.

A refrigerating and/or air conditioning system except a unit system (Par. 137) used in a commercial and/or business place, such as a meat market, store, florist shop, hotel, office building, restaurant, candy shop, bakery and other places of similar commercial enterprises, assembled and installed in the manufacturing and/or business portion of any building.

LIMITATIONS OF INDUSTRIAL SYSTEMS

310: Industrial systems using the direct method of refrigeration may be located without restriction in separate buildings or separate sections of buildings, provided:

(a) The pressure imposing element, condenser, receiver, and shell type apparatus of Class "A" systems are placed in a machinery room.

(b) That if a flammable refrigerant is used the entire building for a class "A" system and the machinery room for a class "B" system is made of non-combustible material.

(c) Machinery rooms of Class "A" systems using an irritant or flammable refrigerant have two exits.

(d) The number of workmen employed above the first story does not exceed one for each two hundred square feet (200 sq. ft.) of floor area of the stories above the first.

311: Commercial systems using the direct method of refrigeration are limited in locations as follows:

(a) Any system may be installed in the basement, first story, top story or on roof.

(b) If a non-irritant and non-flammable refrigerant is used, systems installed between the first and top story may contain one thousand pounds (1000 lbs.) or less of refrigerant.

(c) If an irritant or flammable refrigerant is used and the building contains a sleeping room, systems installed between the first and top story may contain one hundred pounds (100 lbs.) or less of refrigerant. If there is no sleeping room, such systems may contain two hundred pounds (200 lbs.) or less of refrigerant.

(d) If an irritant or flammable refrigerant is used, the entire system must be confined to the space occupied by a single tenant if the building containing such system is over three (3) stories in height or if it contains a sleeping room.

312: A machinery room must be provided for the pressure imposing element, condenser, receivers, and shell type apparatus of commercial systems using an irritant or flammable refrigerant as follows:

(a) For basement, first story and top story systems containing over five hundred pounds (500 lbs.) of refrigerant.

(b) For systems between the first and top stories of business buildings containing over one hundred pounds (100 lbs.) of refrigerant.

(c) For systems between the first and top stories of a combination business and residence building containing over fifty pounds (50 lbs.) of refrigerant.

313: All refrigeration in the following locations, except that provided by unit systems (Par. 132 and 137) as permitted in Sec. IV and as permitted in Par. 314 must be supplied by the Indirect Method of Refrigeration (Par. 116), with the entire refrigerant-containing apparatus placed in a machinery room (Par. 120).

(a) Theatres and similar places of public assembly;

(b) Exhibition and assembly halls above the first story;

(c) Buildings containing wards and private rooms of hospitals;

(d) Asylum dormitories;

(e) Schools, except laboratories used for teaching refrigeration;

(f) Main entrances and exits of:

1—Public buildings
2—Business buildings
3—Factory buildings with only one exit;

(g) All places where unit systems are prohibited in Par. 402;

(h) If a flammable or irritant refrigerant is used, any room not separated from locations a, b, c, d, and e above by an unpierced fire-resisting wall.

(i) In the above locations liquid cooled by an irritant or flammable refrigerant shall not be used in a spray system to cool the air (although this is one form of an indirect system).

314: Evaporators of systems using a non-flammable and non-irritant refrigerant may be installed in the air ducts of air cooling and air conditioning systems provided:

(a) Non-corroding materials are used or permanent protection against corrosion, such as galvanizing, is provided.

(b) The evaporators are tested to least one and one-half the minimum pressures specified in Par. 370.

(c) The total refrigerant content of systems containing over five hundred pounds (500 lbs.) of refrigerant shall not exceed one pound (1 lb.) for one hundred fifty cubic feet (150 cu. ft.) of volume in the space to which the air is conducted.

Design and Construction

321: Every part of a refrigerating system, except pressure gauges and control mechanism, shall be designed, constructed, and assembled to withstand safely and without injury the required minimum test pressures specified in Par. 370. The design and construction of pressure vessels shall conform to the rules of authority having jurisdiction.

Safety Devices

330: Safety Devices: Construction, Location, Size and Discharge.

331: All safety devices shall be constructed of materials suitable for the refrigerant used and unless otherwise specified shall be set to prevent the pressure exceeding the test pressure.

332: Pressure limiting devices are required as follows:

(a) On every class A, B and C system, operating above atmospheric pressure, to stop the action of the pressure imposing element at a pressure less than 90% of the setting of the pressure relief device located on the high pressure side of the system.

(b) On water cooled Class C and D systems using a water cooled condenser so constructed that the pressure imposing element is capable of producing a pressure in excess of the test pressure.

333: Pressure relief valves are required as follows:

(a) In Class A and B systems except those using centrifugal pressure imposing elements on the high pressure side between the main stop valve and the pressure imposing element, to relieve excessive pressure into the low pressure side of the system or to the atmosphere.

(b) In Class A, B and C systems on shell type apparatus, such as liquid receivers, condensers, evaporators, liquid separators, and absorbers which can be shut off by stop valves.

(c) On the low pressure side of the systems into which the relief valves on the high pressure side are discharged. This relief valve shall be vented to the atmosphere as provided in Par. 339.

334: Hand operated valves are required in Class A and B systems operating normally above atmospheric pressure to discharge the refrigerant from the high pressure side in case of fire. Such valve shall be located outside the machinery room or shall be controllable from the outside.

335: Rupture members may be substituted for the relief valves in carbon dioxide systems or systems operating below atmospheric pressure.

336: Class C and D and E systems, unless so constructed that they will not burst due to the expansion of the refrigerant when subjected to abnormal outside temperature such as that generated in a fire, are to be protected by a pressure relief device.

337: No stop valve shall be located between a pressure relief device or pressure limiting device and the part of the system protected thereby, unless two devices of required size are used and so arranged that only one can be shut off for repair purposes at any one time.

338: Liquid level gauge glasses, except those of the bull's eye type, shall have automatic closing shut-off valves, and such glasses shall be adequately protected against injury by slotted metal casings.

339: Refrigerant shall be discharged from the relief valve as follows:

(a) Where an irritant or flammable refrigerant is used, the discharge, if to the atmosphere, must be conducted to the outside not less than twelve (12) feet above the grade, and not closer than ten (10) feet to any opening in any building, or closer than twenty (20) feet to any fire escape. The discharging pipe shall be not less than the size of the relief valve outlet. The discharge from more than one relief valve may be run into a common header, the area of which shall be equal to the areas of the pipes connected thereto, and the outlet of which shall be turned downward.

(b) Where ammonia is used in a Class B or C system, the discharge may be into a tank of water which shall be used for no purpose except ammonia absorption. At least one gallon of fresh water shall be provided for every one (1) pound of ammonia in the system. The water used shall be prevented from freezing without the use of salt or chemicals. The tank shall be substantially constructed of not less than one-eighth (⅛) inch or No. 11 U. S. gauge iron. No horizontal dimension of the tank shall be greater than one-half (½) the height. The tank shall have a hinged cover or, if of the enclosed type, shall have a vent hole at the top. All pipe connections shall be through the top of the tank only. The discharge pipe from the pressure relief valves shall discharge the ammonia in the center of the tank near the bottom.

340: The size of the relief valves as required, shall be as shown on Table I.

TABLE I

Required size of relief valves (Par. 340)

Pounds of Refrigerant in System	Carbon Dioxide and Ethane Number	Carbon Dioxide and Ethane Size	Other Refrigerants Number	Other Refrigerants Size
Up to 1,000 lbs.	1	½"	1	½"
1,000 to 1,800 "	1	½"	1	¾"
1,800 to 3,000 "	1	½"	1	1"
3,000 to 5,000 "	1	½"	1	1¼"
5,000 to 7,500 "	1	¾"	1	1½"
7,500 to 13,500 "	1	1"	1	2"
13,500 to 27,000 "	—	—	2	2"

341: Where rupture members are permitted and used, the equivalent area of the relief valve specified must be provided.

342: Fusible plugs shall have a maximum fusing point of (280) degrees Fahrenheit. The free opening shall be one-sixteenth inch (1/16") in diameter for one hundred pounds (100 lbs.) or less of refrigerant.

351: No fire, flame, or arc light will be permitted in a Class A, B or C machinery room in which a flammable refrigerant is used.

352: No major electrical equipment except the motors and switchboards necessary to operate the machinery shall be permitted in a Class A or B machinery room using a flammable refrigerant. All starting equipment, including switches, automatic starters, and the like, shall be of the oil-immersed or totally enclosed type.

353: All Class A and B systems using a flammable or irritant refrigerant shall have an emergency switch controlling all of the electrically operated refrigerating machinery or the remote control of such a switch so located outside of the machinery room that it can be quickly reached and operated in case of necessity.

361: All refrigerant piping, tubing, fittings and valves shall be of materials suitable for the refrigerant used and shall withstand the pressures as shown in paragraph 370.

362: All piping and tubing containing the refrigerant shall be supported by strong, durable and fire resisting material in such a manner as to prevent excessive vibration and strains at joints and connections and all refrigerant containing parts, and refrigerators containing such parts must be so rigidly supported or secured that they cannot be disturbed without the aid of tools or undue force.

363: No refrigerant line shall be located in any elevator dumbwaiter or other shaft containing a moving object or one that has openings to living quarters and/or main exit hallways.

364: No connection shall be made with the public water supply which will impair the purity thereof. Water used for removing heat from a refrigeration system shall not thereafter be used for drinking purposes.

365: The minimum strength of connecting pipes or tubing shall be as follows:

(a) Standard weight butt welded pipe may be used for test pressures not exceeding one hundred and fifty pounds (150 lbs.). Extra heavy butt welded pipe must be used for higher test pressures.

(b) Lap welded standard weight pipe or seamless tubing of the same size may be used for test pressures not exceeding three hundred pounds (300 lbs.). Extra heavy sizes must be used for higher test pressures.

366: All flanged fittings for Class A and B systems subject to working pressures in excess of one hundred (100 lbs.) pounds shall be of the recessed gasket type.

367: Stop or service valves shall be provided on systems where required to retain the refrigerant charge when parts are disconnected as follows:

Stop Valves for Class A and B systems in:

(a) Inlet and outlet pipes of each pressure imposing element.
(b) Inlet and outlet pipes of each liquid receiver.
(c) Each liquid, and suction branch header.
(d) Each inlet and outlet pipe of each evaporator.

Stop or Service Valves for Class C systems, in:

(a) Each inlet and outlet pipe of each pressure imposing element.
(b) Each outlet of each liquid receiver.
(c) Each inlet and outlet line connected with each evaporator (expansion coils excepted).
(d) Each inlet and outlet pipe of each flooded type evaporator which can be removed as a unit.

368: Check valves shall be installed in the discharge pipes of each pressure imposing element of Class A and B systems, using an irritant or flammable refrigerant.

Copper Tubing

369: Protected seamless copper tubing may be used for lines containing refrigerant in Class C, D and E systems, provided:

(a) The minimum wall thickness shall be thirty-four thousandths (.034) inches.

(b) For outside diameters over five-eighths inches (⅝") the wall thickness shall be increased in the ratio of the new diameter to five-eighths inches (⅝").

(c) Refrigerant containing tubes shall be enclosed in iron pipe or tubing. The enclosing conduit may be of flexible metal at bends or terminals if not exceeding six feet (6 ft.) in length, and if supported rigidly.

(d) All valves and fittings, except service valves, and those at the evaporator, pressure imposing element, liquid receiver, or shell type apparatus, and every connection of tubing shall be arranged in or on a suitable metal box and shall be rigidly attached thereto or to the supports thereof. Every such box shall have an accessible door or removable cover.

(e) All stop valves shall be easily accessible and have permanently attached hand-wheels, levers or some other device for easily operating them without other tools.

(f) A valve shall be located in the inlet end of each branch liquid pipe and in the outlet end of each branch suction pipe, and in the liquid and suction lines of each service outlet.

(g) Possible distribution of escaping refrigerant by the conduit system is to be prevented by sealing the space around the refrigerant containing lines at the upper end of each piece of enclosing conduit.

(h) All refrigerant line joints shall be accessible.

(i) No enclosing conduit shall be required for refrigerant lines:

(1) Between the pressure imposing element, condenser, or shell type apparatus and the nearest riser box if such lines are not over six feet in length.

(2) In class "D" and "E" systems confined to the space of a single tenant.

(*Concluded on Opposite Page*)

Official Copies

THE Standard Safety Code for Mechanical Refrigeration sponsored by the American Society of Refrigeration Engineers and recently approved by the American Standards Association is printed in full herewith.

The code as it now reads contains minor changes made since it was published in full in the May 7th issue of Electric Refrigeration News. These consist of changes in wording, the addition of several new paragraphs, and a complete revamping of the numbering system of paragraphs.

Official copies of this code may be obtained by writing to the New York headquarters of the American Society of refrigerating Engineers at 37 West 39th Street, New York, N. Y. Individual copies are available at 30c each, while group lots of 100 copies are priced at 10c per copy.

(*Concluded from Opposite Page*)

(j) Every opening from or into an enclosing conduit for refrigerant tubes shall be free from sharp edges which might injure the tubing.

TESTS

370: After complete installation and before operation, every refrigerant containing part of every system that is assembled and piped in place, except evaporators, pressure imposing elements, receivers and condensers for Class "C," "D" and "E" systems that are factory tested, shall be tested and proved tight under the minimum pressures shown in Table II.

TABLE II
Minimum Test Pressure (Par. 370) in Pounds Per Square Inch

Refrigerant	Symbol	High Pressure Side	Low Pressure Side
Carbon Dioxide	CO_2	1500	750
Ethane	C_2H_6	1100	550
Ammonia	NH_3	300	125
Propane	C_3H_8	250	125
Methyl Chloride	CH_3Cl	175	125
Sulphur Dioxide	SO_2	135	100
Isobutane	C_4H_{10}	135	100
Butane	C_4H_{10}	100	50
Ethyl Chloride	C_2H_5Cl	100	50
Dichloromethane	CH_2Cl_2	15	15
Dichloroethylene	$C_2H_2Cl_2$	15	15
Trichloroethylene	C_2HCl_3	15	15

371: For other refrigerants the minimum test pressure for the high pressure side shall not be less than the vapor pressure of the refrigerant at one hundred and fifty (150) degrees Fahrenheit and the test pressure for the low side should not be less than one-half (½) of this.

372: The installer of every Class A, B and C system shall notify the authority having inspection jurisdiction not less than twelve hours previously, the day and hour on which the final tests are to be applied. Tests of installations in new buildings shall be made before the piping and connections of the system are covered or made inaccessible.

373: A dated declaration of such test, signed by the manufacturer or installer, shall be posted in the machinery room within ten feet of the pressure imposing element. If an inspector is present at the tests, he shall also sign the declaration.

374: Manufacturers supplying compressors, condensers, receivers, evaporators or other pressure vessels of refrigerating systems for sale to others for assembly purpose where such complete systems are not sold under the manufacturer's name and/or trade name shall test these parts to at least the pressures specified herein and shall stamp the test pressure, the name of the refrigerant for which they are built, and their name on each major part.

380: Operating precautions.

381: It shall be the duty of the person in charge of the premises wherein any refrigerating system is located to exercise due diligence to see that the refrigerating system is properly maintained and operated at all times.

382: A gas helmet or mask suited to the refrigerant used shall be provided with every Class A and B system that operates above atmospheric pressure, (carbon dioxide systems excepted).

383: Every gas helmet or mask shall be of a type approved by the U. S. Bureau of Mines as suitable for the refrigerant used, shall be inspected annually and shall be kept in operative condition in an easily accessible case or cabinet.

384: All flammable or irritant refrigerant withdrawn from any system shall be discharged into a suitable absorbent or container.

385: Containers shall not be connected to the system except during charging or withdrawing periods.

386: In testing with air pressure supplied by the pressure imposing element the discharge temperature shall not exceed one hundred and fifty (150) degrees Fahrenheit.

387: Every owner of every Class A B and C system shall conspicuously post as near as practicable to the pressure imposing element of such system a card giving amount of refrigerant charge, operating directions and precautions to be observed in case of a break-down or leak, including the following:

(1) Instructions for shutting down system in case of emergency.
(2) The name, address and telephone number of every engineer and operator in charge.
(3) The name, address, and day and night telephone numbers for service.
(4) The location of the nearest fire alarm box.
(5) The name, address and telephone number of the physician or hospital to be called in case of emergency.

388: Every system shall have the name of the refrigerant used printed on or affixed in a permanent manner thereto as follows:

(1) Class A and B systems:
  (a) The pressure imposing element or piping adjacent thereto.
  (b) The liquid receiver.
  (c) Refrigerant lines.
  (d) Every shell type apparatus and evaporator not in a refrigerated space.
  (e) On the door or adjacent thereto of every refrigerated space, cabinet or box containing an evaporator except in industrial systems (Par. 117).
(2) Class C systems:
  (a) The pressure imposing element condenser, receiver or anyone of these when all are assembled as a unit.
  (b) Refrigerant lines.
  (c) On each evaporator and cabinet or box containing same.
(3) Class D and E systems:
  (a) On machine name plate and cabinet or box.

SECTION IV

UNIT SYSTEMS

"A system which can be removed from the user's premises without disconnecting any refrigerant containing parts."

401: Unit systems shall consist of Classes "D" and "E" only.

402: Limitations as to use:

(a) No unit system containing an irritant, flammable or harmful refrigerant shall be placed in wards, or private rooms of hospitals, sleeping quarters of asylums, cell blocks of prisons, or any place where people are confined or helpless.

(b) Unit systems containing not over three and one-half pounds of refrigerant, and sealed units containing not over six pounds of refrigerant tested to two (2) times the pressure specified herein can be located anywhere except as provided in Par. 402 (a).

(c) Only the systems specified in (b) (above) will be permitted in sleeping rooms (Par. 135).

(d) Only Class "E" systems shall be placed in:
  (1) Entrances and exits of public buildings.
  (2) Lobbies and auditoriums of places of public assembly.
  (3) Dance and assembly halls above the first floor.
  (4) Exits and entrances of buildings not classed as public buildings, having less than two thousand cu. ft. of volume per one pound of refrigerant used.
  (5) Underground waiting-rooms.
  (6) Subways.
  (7) Diet kitchens of hospitals. Such kitchens shall have tight-fitting, self-closing doors, and ventilation to the outside air by means of an easily opened window.

Construction

403: A system unless so constructed that it will not burst due to the expansion of the refrigerant when subjected to an abnormal outside temperature, such as that generated by a fire, shall be protected by a pressure relief device as follows:

(a) Safety valves, if used, shall be one-quarter inches (¼") in size.

(b) Rupture members, if used, shall have at least a one-sixteenth inch (1/16") in diameter.

(c) Fusible plugs, if used, shall have a maximum fusing point of two hundred and eighty degrees Fahrenheit (280° F.) and a free opening of one sixteenth of an inch (1/16") diameter.

404: All systems shall conform to the provisions of paragraphs 321, 361, 362 and 370.

405: Makers shall mark plainly thereon the following information:

(a) Maker's name.
(b) Kind of refrigerant used.
(c) Amount of refrigerant used to the nearest pound.
(d) The test pressure or pressures applied.

SECTION V

APARTMENT DWELLING SYSTEMS

"An apartment dwelling system is a refrigerating system employing the "direct method" in which the refrigerant is delivered by a pressure imposing element to two or more evaporators in separate refrigerators or refrigerated spaces located in rooms of separate tenants in multiple residence buildings.

501: All apartment dwelling systems shall also comply with the following foregoing paragraphs, regarding the subject specified:

(a) 321—Construction for strength.
(b) 331—Setting of safety devices.
(c) 332—Pressure limiting device.
(d) 336—Pressure relief valves.
(e) 337—Stop valves.
(f) 338—Liquid gauges.
(g) 361—Suitable materials.
(h) 362—Piping supports.
(i) 363—Location of refrigerant lines.
(j) 365—Strength of pipe.
(k) 367—Location of stop or service valves.
(l) 370—Tests.
(m) 372—Notification of test.
(n) 373—Declaration of test.
(o) 374—Manufacturer's stamping of parts.
(p) 381—Operating precautions.
(q) 384—Operating precautions.
(r) 385—Operating precautions.
(s) 386—Operating precautions.
(t) 387—Operating precautions.
(u) 388—Affixing name of refrigerant.

502: Any refrigerant, the vapors of which are harmful to health and which are not readily apparent to a human sense shall have added thereto a substance to make its vapors readily detectable.

503: No evaporator will be permitted in any sleeping room (Par. 111).

504: Every refrigerator, cabinet, box, casing, or refrigerated space containing or enclosing any evaporator shall be firmly and securely anchored or fixed to a wall, floor and/or other immovable object, in such a manner as to hold such refrigerator, box, or casing and the evaporator securely in place.

505: An irritant or flammable refrigerant will be permitted in Class D and E apartment dwelling systems using for refrigerant distribution lines pipe or tubing as specified in paragraph 365, or protected copper tubing complying with and installed in accordance with paragraph 369.

506: Class "C" apartment dwelling systems containing not over fifty pounds (50 lbs.) of an irritant or flammable refrigerant will be permitted if in addition to the provisions of paragraph 505 the following are complied with:

(a) The pressure imposing element condenser, liquid receiver and distribution header are located in a separate machinery room.

(b) The high pressure side shall be divided by means of a distribution header located in the machinery room into separate sections, each containing not more than twenty pounds (20 lbs.) of refrigerant. A check valve shall be placed in the liquid line of each section at the distribution header.

(c) Not over twenty (20) percent of the total charge shall be contained in the high pressure side between the pressure imposing element and the check valves in the distribution lines.

507: Class "C" apartment dwelling systems containing an irritant or flammable refrigerant and using pipe or tubing as specified in Par. 365 and/or 369 may be installed subject to the following provisions:

(a) The pressure imposing element, condenser, liquid receiver, and distribution header shall be located in a separate machinery room.

(b) Each evaporator must be tested to twice the pressure specified in paragraph 370.

(c) The conduit or pipe system enclosing the copper tubing shall be made sufficiently tight that it requires one hour for an air test of two pounds (2 lbs.) to drop to one pound (1 lb.).

(d) After testing, the conduit system enclosing the copper tubing shall be vented above the roof.

(e) The conduit system for the copper tubing shall enclose all joints between machinery room and each evaporator so that the only leak which would not be conducted to the roof or to the machinery room would be one occurring in the body of the evaporator.

(f) Systems using pipe or tubing as specified in Par. 365 shall include a device that will stop the pressure imposing element when a maximum of ten (10) pounds of refrigerant has been lost from the system.

508: The enclosing conduit required in paragraph 507 if complying with paragraph 365 may be the suction pipe provided same is protected with a pressure relief valve discharging above the roof and set to relieve the pressure at one-half the test pressure specified in paragraph 370.

509: Five hundred pounds (500 lbs.) of a non-irritant and non-flammable refrigerant will be permitted in systems conforming to the specifications for Class "B" commercial systems if tested to one and one-half (1½) times the pressures specified in paragraph 370.

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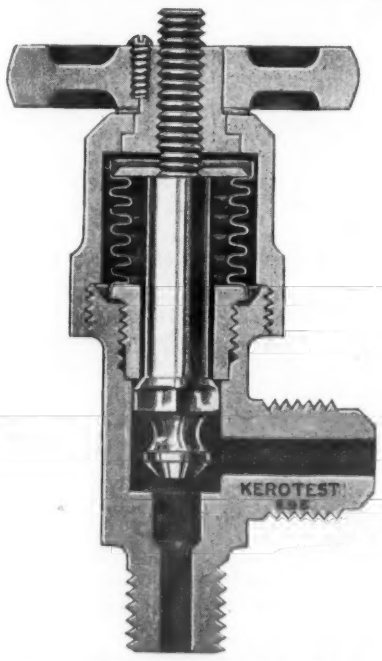
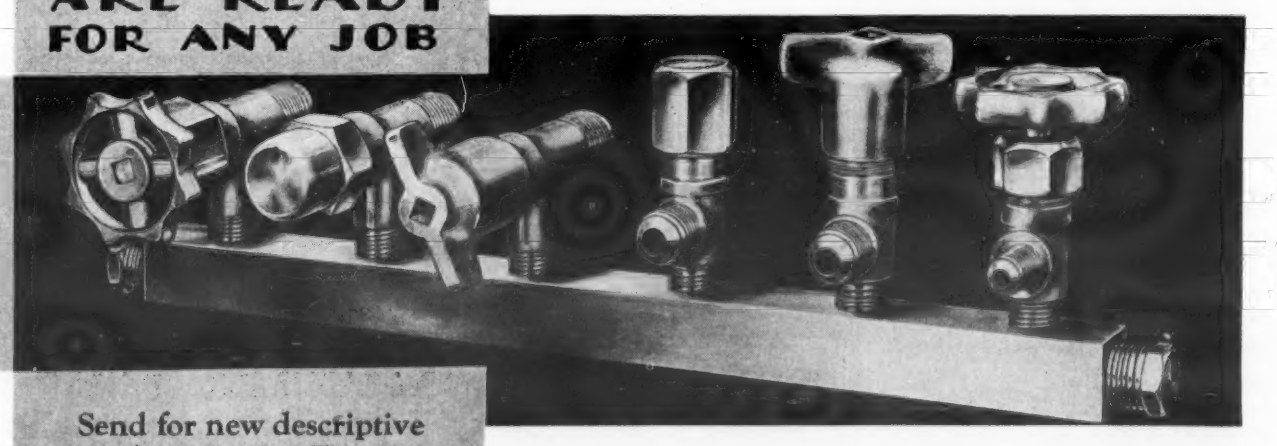


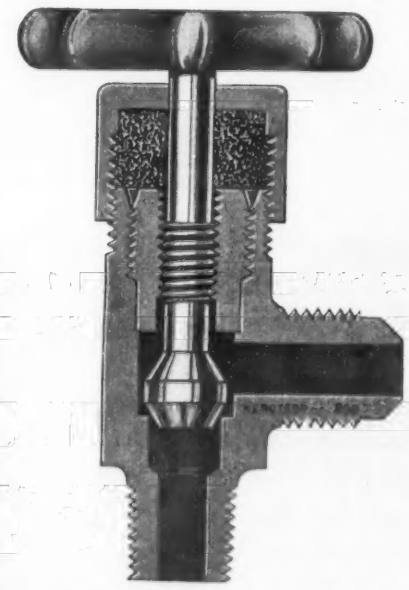
TYPE 295 VALVE
Packless Angle Valves with back-seating bushings — non-rotatable stems. High pressure metal to metal joint made when stem is in full open position.
PATENT APPLIED FOR

KEROTEST MANIFOLDS
ARE READY FOR ANY JOB



Send for new descriptive catalog covering Kerotest manifold valves and fittings—just off the press.

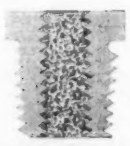
KEROTEST



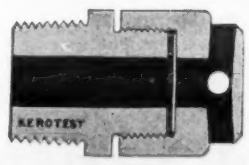
TYPE 296 VALVE
Metal to Metal Seating Angle Valves. Double Seal in full open position—may be repacked under pressure in open or closed position.

Equipped with any style of seal caps you may specify or with packless valves if you so prefer. A wide choice for your every specification.

KEROTEST MANUFACTURING CO.
Pittsburgh, Pa.

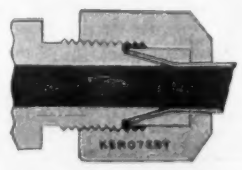


TYPE 467
Fusible Safety Plugs Melting Point 165°F. or 212°F.

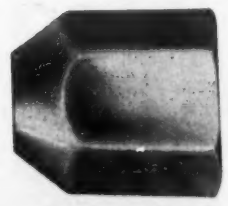


Rupturable Safety Devices to relieve excessive pressures and to comply with safety code specifications.

KEROTEST
Manufactures
A Complete Line of Extra Heavy Flare Fittings



Flare tube connections with intermediate bushings to comply with safety code specifications.



TYPE N-4
Extra-Heavy Forged Brass Flare Nut.

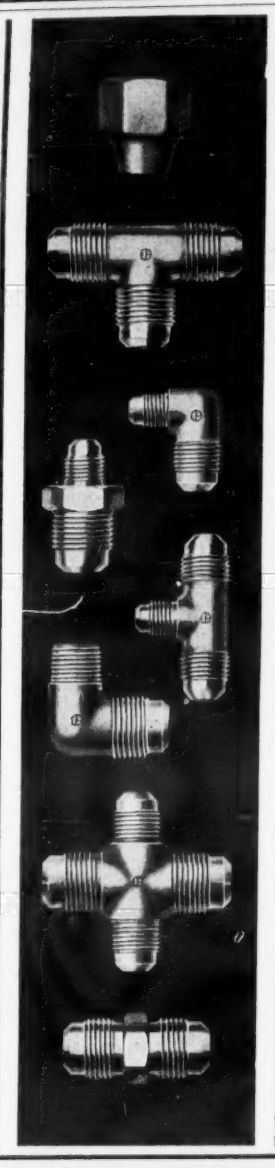
Filtrine Give your electric water cooler an additional selling point by equipping it with a FILTRINE guaranteed filter. Pure, clear water assured.

FILTRINE MFG. CO.
49 LEXINGTON AVE., BROOKLYN, N. Y.
Manufacturers of filters and coolers in all sizes

E. F. THEIS LEAVES SERVEL

Evansville, Ind.—E. F. Theis has resigned from his position as general production manager of Servel, Inc., Evansville.

THE NEW CODE



. . . . may make changes in methods of installation yet the necessity of using vapor-proof fittings is unchanged.

Commonwealth Brass Fittings for automatic refrigeration are made from extruded rod, or hot forged brass and are guaranteed positively . . . . . .

SEEPAGE PROOF

Either for multiple installations or individual boxes, whether for original equipment or replacement, manufacturer or installer may rely on Commonwealth Fittings to meet all Code requirements.

Send for catalog No. 36, fully descriptive of our line

BUILT RIGHT TO STAY TIGHT

COMMONWEALTH BRASS CORPORATION
Commonwealth at G.T.R.R.
DETROIT

Visitors From the Netherlands

Mt. Clemens, Mich.—Interested visitors at the Copeland factory here recently were J. L. H. Ferwerda and J. Verbeek of Gonnermann & Company, Machinfabriek, Copeland distributors for the Netherlands.

This firm, located in Haarlem, Holland, is well known throughout the electric refrigeration industry in Europe as manufacturers of heavy-duty equipment. A short time ago they felt the need for a line of domestic and light commercial equipment and took over a Copeland franchise.

The purpose of the visit, according to Mr. Ferwerda, sales manager of the company, was to learn at first hand how Copeland machines were built, and to get better acquainted with the Copeland management. As the company does an extensive business in the Dutch East Indies, it was decided to have Mr. Verbeek, sales manager for Java, also make the trip.

"Domestic and the light type of commercial electric refrigeration equipment is much in demand in Holland today," Stated Mr. Ferwerda. "We plan to develop both lines and expand our business during 1931."

In the picture here are: Seated—J. Verbeek (left) and J. L. H. Ferwerda (right) of Gonnermann & Company, Machinfabriek; George C. Licence, assistant service manager at Copeland, is the third man in the photo.

G. E. MAKING BIG PLAY FOR CHRISTMAS DOLLAR

(Concluded from Page 1, Column 4)

cated by the location of a cut-out of a candy girl and an usher. The former will indicate where sales should be on that day, and the latter will show percentage of total sales toward quota.

"For Men Only" is cleverly designed and a sequence of events paves the way for salesmen so that they may get the opportunity to tell their story and assist bewildered husbands in meeting the problem of selecting the gift for the family. Once the salesmen has dug up a prolific source of names, he starts into action by sending a "curiosity promoter" bearing the message: "Do you know what to buy your family for Christmas?" to the prospect's place of business.

The second reminder sent via the mail-man is a blotter with the question, "Have you decided what to buy your family for Christmas?" On the third day the salesman mails out another piece with this message: "Seriously now! Have you any idea what you should buy your family for Christmas?"

By this time it is expected that the weary husbands will be giving considerable time to the big question. The salesman's next move is to call on the prospect at his office. His special calling card bears a brief notation: "It's about that Christmas present for your family."

General Electric has prepared an attractive prospectus on the contest for its sales organization. It is done in red and green to emphasize the holiday idea and all material for use in the contest is reproduced. To help salesmen, G. E. has prepared a story, "When Christmas Comes," which puts the salesman in the right frame of mind by showing him that he can capitalize on the Christmas idea.

GLAD RAGS CONTEST TO SPUR ON KELVINATOR MEN

Detroit, Mich.—The Contest Department of the Kelvinator Sales Promotion Division has just announced in a big broadside, in colors, an unusual sales contest, which is given the descriptive title of "Glad Rags."

The "Glad Rags" contest, which is open to all Kelvinator retail salesmen in the United States, starts November 22nd and closes December 24th.

There are twelve rules to the contest, which relate chiefly to the point system by which successful salesmen will accumulate the "Glad Rags." The prizes include everything in the wardrobe of a well-dressed man, from a suit of underwear to a tuxedo, suspenders, spats, pajamas, overcoat and hat.

FRIGIDAIRE UNFOLDS 1931 PLANS TO FIELD STAFF

Dayton, Ohio.—Distributors and branch managers of Frigidaire Corporation for the United States and Canada convened at the factories here Wednesday morning, Nov. 5, for their semi-annual conference. Two days were devoted to a discussion of merchandising plans for 1931.

An aggressive newspaper and advertising campaign beginning early next year, and general subjects relating to the distribution and sale of the organization's products, were topics given consideration. E. G. Biechler, president and general manager of the company, presided. Speakers included R. D. Funkhouser, C. A. Copp, J. A. Harlan, E. R. Newill, B. J. Van Doren, C. H. Jamerson, E. D. Doty, George S. Jones, Jr., J. J. Nance, G. A. Ames and H. F. Lehman.

MAJESTIC BADGES STIR UP INTEREST

Kansas City, Mo.—The advertising department of the Sterling Radio Company, Kansas City, of which L. C. Truesdell is manager, has worked out a campaign for promoting Majestic refrigeration in the towns of less than ten thousand, throughout its territory in Kansas and Missouri.

Badges in the form of miniature Majestic refrigerators are passed out by boys on street corners on Saturday afternoons. An ingenious method of inducing people to wear these badges instead of throwing or putting them away, was devised by not only having numbers, a small percentage of which are duplicates, on the badges but by giving a cash prize of $10 to the two persons having the same numbers.

Because of this detail, people not only wear their badges so that they may compare numbers, but neighbors talk it over their phones and make every effort to match the lucky numbers before the end of the week.

When the duplicate number bearers present their Majestic badges at the dealers, they receive their $10.

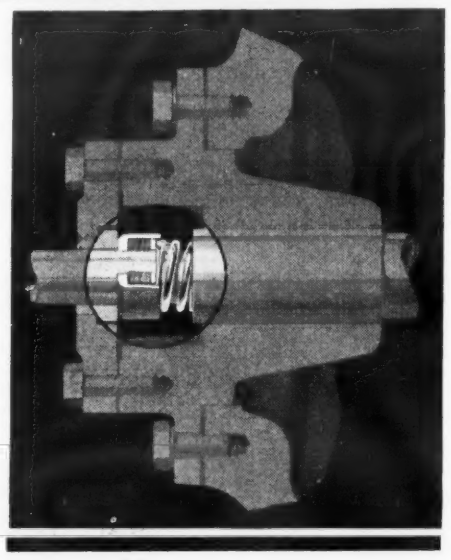
The color of the badge is changed each week and they will be given out until Christmas.

GEORGIA POWER TURNS CLOTHIER

Atlanta, Ga.—Star salesmen of the Georgia Power Co. are sporting new suits, overcoats, shoes and hats as a reward for their efforts in the fall electric refrigeration campaign conducted by the company. The more fortunate ones were given the choice of a $50 suit or overcoat.

E. R. Zachary of Augusta, L. T. Holt of Americus district, L. L. Peters of Brunswick, and J. D. Blitch of Statesboro, are proud owners of either new suits or overcoats.

N. A. R. Lawrence of Augusta, G. B. Starnes of Rome, L. D. Lovett of Milledgeville, and C. P. McRae, McRae district, are all breaking in new $10 kickers and sporting new $10 hats.



For Maker and Dealer The Sooner the Better

By absolutely preventing leakage around the shaft, and by decreasing motor load and shaft friction, the Cooke Seal Ring wipes out a large part of all refrigerator problems.

Leak proof, smooth running, quiet—you are losing profits—and new business—as long as you try to get along without the Cooke Seal Ring.

And for dealers faced with servicing of machines not Cooke-equipped, it is good news to realize that they can repair, on the job, with a minimum of time and labor, worn out packing or other types of seals with the Cooke Seal Ring.

It costs less than any other type of seal and it will last indefinitely.

Dealers and manufacturers will be wise in using this coupon now.

COOKE Seal Ring

20 N. GREEN STREET, CHICAGO, ILLINOIS, DEPT. F.

Cooke Seal Ring,
20 N. Green Street, Chicago, Dept. F
Please tell me more about Cooke Seal Rings.

Name.....

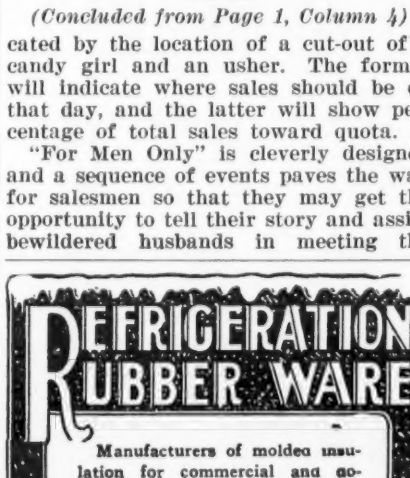
Address.....

City.....State.....

REFRIGERATION RUBBER WARE

Manufacturers of molded insulation for commercial and domestic refrigerator cabinets. Materials and parts developed to meet the exacting requirements of refrigeration efficiency

THE AETNA RUBBER CO.
ASHTABULA, OHIO



Specify
ROME-TURNEY CONDENSERS

Made of heavy gauge deoxidized seamless copper tube. One-piece construction. High efficiency. Designs for all requirements and conditions.

Rome-Turney Radiator Co.
ROME, N. Y.

Testing Service
for Domestic and Commercial Electrical Refrigeration

Testing and experimental laboratory service for Manufacturer, Distributor, Central Station. Test data exclusive property of client.

ETL Know by Test
Electrical Testing Laboratories
80th St. & East End Ave.
NEW YORK

Absopure
ELECTRIC FRIGERATOR

12 HOUSEHOLD MODELS
All porcelain and porcelain-lined. From 4.3 to 32 cu. feet capacity.

COMPLETE COMMERCIAL LINE For Meat Markets, Grocers, Florists, Apartment House Multiple.

THE Absopure franchise is an asset whose value will increase as refrigeration comes into its own. Some territory is still open. For details—write or wire the factory.

Absopure
Refrigeration Corporation
1560 Theodore Street
DETROIT - - MICHIGAN

Metal Stampings
Unit Bases and Guards
Household Refrigerator Metal Panels—Exterior or Inside Panels and Food Compartments.
Louvered Panels—Special Trays or Panels—Water Cooler Panels.
MOTORS METAL MFG. CO.
5936 MILFORD AVE. DETROIT, MICH.

CHICAGO'S NEWSPAPERS PRAISE REFRIGERATION

Chicago, Ill.—Daily newspapers in this city recently gave the R. Cooper organization and the electric refrigerator a good boost. The big prosperity meeting held by R. Cooper, Jr., Inc., at the Palmer House, November 3, was the subject of many stories in which it was pointed out that for the Chicago distributor this has been an exceptionally prosperous and normal year.

More than twelve hundred guests were present at the afternoon session and the banquet in the evening. Besides dealers and salesmen there were utility representatives, bankers, business executives, architects, builders and real estate men in attendance.

The afternoon session in the grand ballroom at the Palmer House got away in good shape, with an enthusiastic gathering of dealers and salesmen on hand to take in the proceedings.

H. W. Gifford, vice-president of the Cooper Company, swung the gavel. He pointed out the growth of the company and the developments in the refrigeration industry in his opening address. C. G. Rood, vice-president of the company, had for his topic, "Past, Present and Future."

To put over the idea of winter selling, the Cooper thespians put on a number of skits. The first skit, "It's Worth the Effort," was a commercial skit in three acts. The Visualizer was used in a one-act skit, "The Way To Put It Over," followed by "True To Life" and "Over a Bottle." "Judgment Day" was presented by the General Contract Purchase Corporation. The Cooper Steam Calliopiers were on hand to pep the crowd up with musical numbers.

Cooper as Toastmaster

R. Cooper, Jr., president of R. Cooper, Jr., Inc., was toastmaster at the evening session. His welcome was addressed to the dealers and utility operators from the new territory recently acquired in the southern and western part of Illinois. In his opening address, Mr. Cooper stated: "We feel justified in terming this a prosperous year; our sales have increased 65% over 1929."

Paul S. Clapp, managing director of the National Electric Light Association, declared the electrical industry was in the first stage of a sustained three-year program, and outlined the five-million-dollar N. E. L. A. campaign to back up refrigeration as a major activity, and the refrigeration branch of the industry have pledged one million sales for 1931. "The electric refrigeration industry has the complete co-operation of the utility companies, and up to the present time they have been placing more new meters than the refrigerators sold," Mr. Clapp said.

Next on the program was P. B. Zimmerman, sales manager of the Electric Refrigeration Department of the General Electric Company, who accepted the challenge issued by Mr. Clapp and by means of charts showed the rapid growth of the electric refrigeration industry from 1926 to 1930. In 1930, he declared, the sales of refrigerators had exceeded the number of new wired homes.

E. W. Lloyd, vice-president of the Commonwealth Edison Company, talked on the support the utility companies were giving the refrigeration industry.

T. K. Quinn, general manager of the Electric Refrigeration Department, General Electric Company, praised the fine enthusiasm exhibited by the organization which enabled such a volume of business to be realized.

Others at the speakers' table were: B. E. Sunny, capitalist and formerly chairman of Board of Directors of Illinois Bell Telephone Company; M. A. Traylor, president, First National Bank; C. Studebaker, president, Illinois Power & Light Company; J. F. Gilchrist, vice-president, Commonwealth Edison Company; Rex Cole, president, Rex Cole, Inc.; W. M. Hodge, vice-president, Byllesby Engineering and Management Corporation; H. L. Hanley, vice-president, Illinois Power & Light Co.; J. W. Busch, assistant vice-president, Illinois Power & Light Co.; W. O. Batchelder, district manager, General Electric Company; A. C. Mayer, manager, merchandising division, General Electric Company; W. J. Cox, vice-president, Foreman-State National Bank; G. A. Hughes, president, Edison General Electric Appliance Co.; Perry Crawford, president, Federal Public Service Company; E. L. Callahan, general commercial manager, Central Public Service Company; E. L. Hinchcliffe, assistant merchandising manager, Middle West Utilities Company; R. I. Parker, district manager, Central Station Division, General Electric Company; F. J. Small, manager, retail sales, Public Service of Northern Illinois; C. M. Nelson, cashier, Northern Trust Company; O. R. Perkins, manager, stoves division, Montgomery, Ward & Company; H. H. Bosworth, manager, central station division, General Electric Co.; Henry Paschen, Paschen Bros., builders; J. L. Kellogg, president, Warren-teed Seed Co.; Leonard Fitzgerald, vice-president, Gary Heat, Light & Water Co.; H. D. Pettibone, vice-president, Chicago Title & Trust Company; Norman Ford, vice-president, Continental Illinois Bank & Trust Co.; R. W. Root, Holabird & Root, architects.

Majestic in Milwaukee

V. H. Maurer

S. G. Swisher, Jr.

Milwaukee, Wis.—The Badger Radio Corporation, distributors of the new Majestic refrigerator, is rapidly franchising Majestic dealers for the refrigerating unit, according to President V. H. Maurer. In all parts of Wisconsin the new Majestic refrigerator has been well received.

S. G. Swisher, Jr., secretary and treasurer of the Badger Radio Corp., in an analysis prepared recently, says that the poorest radio month of the year is equal to about one-half of the best month of the year. By combining refrigeration with radio, the best month will be about 20 per cent above average, and the poorest month about 20 per cent below the average, normal conditions, of course, being taken as the criterion. With refrigeration as an added selling line, an increase of about 50 per cent in volume of business without adding to the overhead is expected to be accomplished.

An addition to the sales staff of the Badger Corp. has recently been made in the appointment of C. W. Hamilton, who is sales manager in charge of the refrigeration department.

Officers of the Badger Radio Corporation are: V. H. Maurer, president and general manager; S. G. Swisher, Jr., secretary and treasurer; E. Durr, general sales manager; C. W. Hamilton, refrigerator sales manager; W. T. Skeels, assistant sales manager in charge of sales promotion, and F. C. Meinhardt, auditor and office manager. W. G. Karman is Wisconsin factory representative.

BIG ORDER FOR ELECTRO-KOLD IN SEATTLE

Seattle, Wash.—Seattle sales of Electro-Kold refrigerators are moving along steadily, according to a recent announcement of H. L. Masterson, general manager of the Electro-Kold Corporation of Spokane, who announced that orders totaling $35,000 for apartment house units have been received.

CORRECTION

THE Despatch Oven Company, manufacturers of ovens and heat treating equipment, has its factory and general sales offices located at 622 Ninth St., S. E., Minneapolis, Minn., and not at 112-116 First Ave., N., Minneapolis, the address which appeared in the directory of the Production Tools Number, Buyer's Guide Section of the November 5th issue of ELECTRIC REFRIGERATION NEWS.

DRY ZERO KEEPS OUT BULLETS

Los Angeles, Calif.—Gangsters and gunmen might take a tip from a Los Angeles company which builds armored truck bodies for transporting securities between one bank and another.

Bodies were constructed by the Robert Thompson Co., with an interior plate of durometal 3/16 inches thick. An exterior plate was of ordinary sheet iron, and between the two were placed two layers of compressed Dry Zero, an insulating material made of Ceiba fibres which grow in pods on tropical trees.

On the police target practice range, shots were fired at the insulated bodies from a distance of eight feet with pistols, rifles and a high-powered machine gun. Only the machine gun bullets were able to penetrate to the inner plate, and they made but slight dents.

Dry Zero is manufactured by the Dry-Zero Corporation, 130 No. Wells St., Chicago.

NEW WAYNES ARRIVE AT SEATTLE

Seattle, Wash.—Offered in eight special sizes, the new Wayne automatic electric refrigerators were recently received at the Wayne headquarters of the Washington Home Equipment Co., 2001 Fourth Avenue. Architects and building contractors of the Northwest were invited by R. C. Wood, president of the Washington Home Equipment Company, to call at the showrooms.

NEW OUTLETS IN EAST

Springfield, Mass.—Twin-State Gas & Electric Company, having a dozen stores in New Hampshire and Vermont, has taken on the sale of the Westinghouse refrigerator.

REFRIGERATOR TOPS LIST IN NEW ENGLAND MARKET

Boston, Mass.—Refrigerators led all electrical appliances in merchandise sales by the New England Power Association, Boston, Mass., in the month of September. Electric refrigerators and electric ranges constituted 39.8 per cent of the total value of merchandise sold.

Refrigerators led ranges, however, both in number sold and valuation. Electric refrigerators made a sales gain of 58 per cent as compared with the corresponding month of last year, and electric ranges made a gain of 56 per cent. The additional annual consumption of ranges and refrigerators sold in September will total about 299,700 kilowatt hours.

The number of these units sold during the first nine months of the year will consume additionally annually 3,833,100 kilowatt hours. September records of the Association show the following appliance sales: electric refrigerators, 161; electric ranges, 112; washing machines, 326; flatirons, 1,861; toasters, 737; vacuum cleaners, 189.

FRIERSON LEAVES FIELD

Winter Haven, Fla.—Arrangements have been completed by H. C. Frierson, of the Refrigeration Improved Appliance Co., with a company in Atlanta, Ga., for marketing the Universal ammonia pre-cooler on a large scale. Mr. Frierson states "that this move engineers him out of the refrigeration game for the present at least."

PATENTS
Searches, Reports, Opinions by a Specialist in REFRIGERATION
H. R. VAN DEVENTER
Solicitor of Patents - Refrigeration Engineer
342 MADISON AVE. NEW YORK

NEW ADJUSTABLE RANCO CONTROL

Provides an Ideal Temperature Range on Household Refrigerator

The Ranco Control for 1930 has many refinements and basic improvements which make it more than ever the ideal control for the modern household refrigerator.

WRITE FOR INFORMATION

The Automatic Reclosing Circuit Breaker Co.
COLUMBUS, OHIO U. S. A.

BUSH
CONDENSERS
THE BUSH MFG. CO.
HARTFORD, CONN.
W. H. MARK HANNA
6-247 GENERAL MOTORS BLDG., DETROIT, MICH.

AMERICAN EXPANSION VALVES
AUTOMATIC-THERMOSTATIC
AMERICAN RADIATOR COMPANY

precision built
Specializing in
Refrigeration Compressor
Eccentric
and
Crank Shafts

Made to your specifications.
Send us your blueprints —we'll send you our prices.
MODERN MACHINE WORKS, INC.
195 MILWAUKEE ST., DEPT. C
MILWAUKEE, WIS.

Precision Built
VALVE Needles
VALVE Seats
VALVE Mechanisms
Four years of satisfactory service to the industry
Buerk Tool Works
42 Pearl St. Buffalo, N. Y.

ICE WATER ON TAP

At the push of a button, anywhere in the building. Richmond Circulating Ice Water Generator will meet the most exacting demand, instantly supplying fresh ice-cold water with maximum reserve capacity, proving equally adaptable and effective in new and renovated buildings.

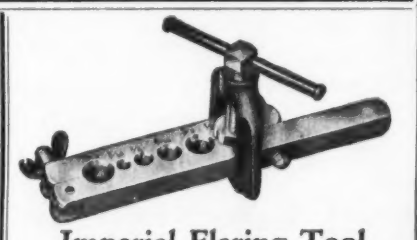
Hotels, office buildings, industrial plants, theaters, hospitals, restaurants, and similar institutions find the economical cost of the Richmond Circulating Ice Water Generator makes it a most beneficial and paying investment. They are used with all types of standard compressor high sides.

Dealers find these a most profitable addition to their compressors, as it gives them a complete line. Full details, prices, and discounts on request, to recognized compressor dealers and distributors.

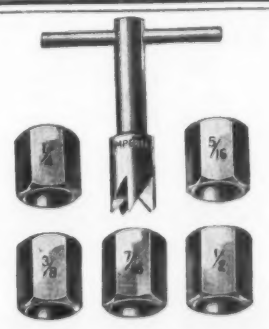
RICHMOND ENGINEERING CO.
PHILADELPHIA, PA.

Imperial
Aids To Better Installations

Imperial Tube Cutter
Here is a highly efficient tool for cutting copper, brass, block tin and lead tubing. It takes all sizes of tubing from 1/8" to 5/8" and makes a right-angle cut, quickly and cleanly, leaving no burrs or chips to clog the line. The tubing does not become out of round as when put in a vise. When this tool is used tubing can be cut in half the time required by old methods and a far better job results. No. 94-F Tube Cutter, each $2.50

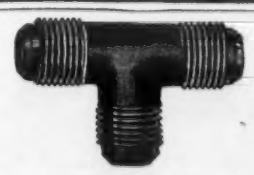


Imperial Flaring Tool
Gives the proper flare and taper to the tubing for making up joints. A perfect flare means a tight joint and this tool does the work in least time and with utmost simplicity. No loose dies — no vise necessary. No. 93-F takes tubing sizes 7/16", 3/16", 1/4", 5/16" 3/8", and 1/2", each $3.00
No. 95-F takes tubing sizes 1/4", 5/16", 3/8", 1/2" and 5/8", each $4.00



Imperial Refacing Tool
This new tool insures against leaks caused by S. A. E. couplings that do not seat properly. In use, the coupling is inserted into the correct adapter, then a few turns of the five-fluted hardened steel refacer produces a faultless seat of correct size and taper for a tight and leak-proof joint.
No. 100-F Refacing Tool with adapters for sizes 1/4", 5/16", 3/8", 7/16" and 1/2". Per Set $3.75

Imperial Tube Bender
Just slip this tool over the tubing where the bend is to be made. Then bend both tube and coil by hand to whatever form desired. Seven Tube Benders comprise a complete set. No. 101F Tube Bender Set for tubing sizes 1/4", 5/16", 3/8", 7/16", 1/2" and 5/8". Per Set $2.75



Imperial Brass Forgings
Accurately made to meet all the requirements of Iceless Refrigerator Manufacturers. Will not leak. Let us quote on your requirements.

Send for New Catalog
The Imperial Catalog, just off the press, illustrates and describes the complete Imperial line of Brass Forgings, Valves, Manifolds, Tools, etc. To become acquainted with the newest and most modern, send for this catalog today. It's free.

THE IMPERIAL BRASS MANUFACTURING CO.
565 SOUTH RACINE AVE. - - - CHICAGO, ILL.

DROP AND UPSET FORGINGS

Whatever your forging problem, in the production of mechanical refrigerators, Defco has the men and machines to deliver what you want, *when you want it.*

The completeness of our plant makes it good business to consult our engineers on any work you may have or plan for the future.

DETROIT FORGING COMPANY

DETROIT MICHIGAN

Members of Detroit Business Pioneers

GLUECK PROVIDES DUCK DINNER

Kansas City—Glueck & Co., General Electric distributors, conducted a sales meeting recently in Abilene, Kansas, for the merchandise organization of the United Power & Light Co., which has its executive offices in that place. The U. P. & L. Co. serves the Kansas district lying between Salina and Manhattan.

The afternoon session was held in the American Legion Hall and was opened by an address by the G. E. sales manager, D. G. Keller. This was followed by a debate: "Resolved, that it is profitable to sell electric refrigeration in winter," with Earl Rambaugh taking the negative and H. G. Evans the affirmative sides. The decision was left to the audience and the affirmative gained the victory.

"Commercial Refrigeration as Applied to the Small Retail Grocer" was the subject of a talk by W. L. Rasmussen, and Russel Seymour demonstrated visual selling of G. E.

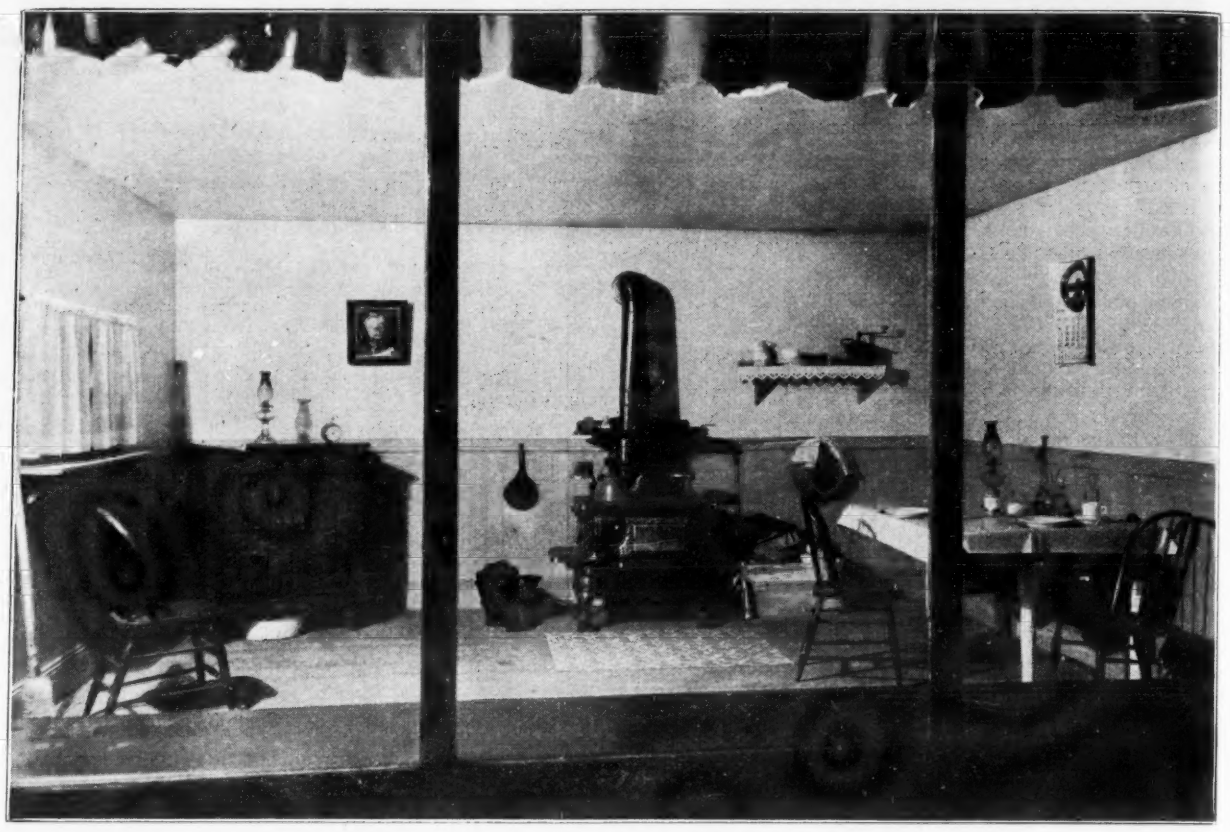
In the evening a duck dinner was served in the hotel dining room, during which talks were made by D. G. Keller, J. Murray Walker, of Cleveland; Major Glueck, president of Glueck & Co., and Leslie A. Falk, general commercial manager of the southwest division of the United Power & Light Co.

BELLINGHAM FRIGIDAIRE IN NEW QUARTERS

Bellingham, Wash.—Frigidaire has a new home in Bellingham. The Electric Appliance Company, A. Wellington, proprietor, has opened headquarters in the Newton Kraack Building on Cornwall Avenue.

Mr. Wellington is planning to place quite a few Frigidaires in Bellingham homes during the next few months.

The Old Fashioned Kitchen



San Francisco, Calif.—At Shell Corner, San Francisco, the Shell Oil Company has devoted two large and well-lighted windows of its handsome office building to a very unusual Electrolux display. In the first window was placed the model of an old-fashioned kitchen, similar in arrangement and equipment to those of our grandmothers. Correct in detail, it contained kerosene lamps, coal stove, wood box, coal bucket, flypaper and an old ice chest. The second display, of course, the antithesis of the first, was equipped with a gas stove and water heater, colorful furniture and

CALCO
Sulfur Dioxide

"Buy the best, by every test"

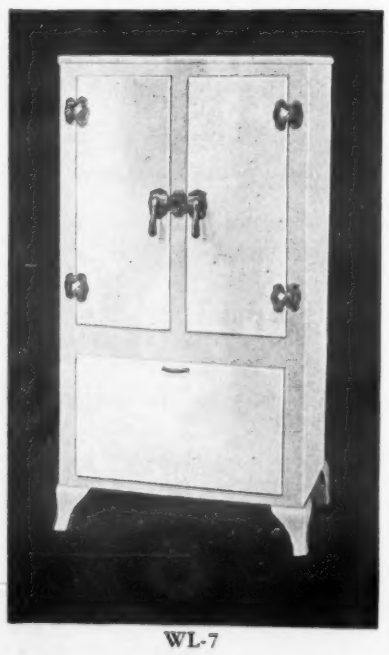
Cylinders - Drums - Tank Cars

THE CALCO CHEMICAL CO., INC.

Bound Brook, N. J.

New York Boston Philadelphia

STARR FREEZE
Electric Refrigerators



WL-7

REAL QUALITY *at* LOW PRICES

The **STARR FREEZE** *is*

POWERFUL . . .
QUIET . . .
ECONOMICAL . . .
DEPENDABLE

and has the features the market demands.

Two Outstanding Models

WL-7 — **7 foot Capacity** — Two Doors **$149.00** List

F. O. B. Factory

WL-5 — **5.1 foot Capacity** — Single Door **$135.00** List

Write Us For Descriptive Literature of Other Styles and Territory Allotment.

THE STARR COMPANY

RICHMOND, INDIANA

REFRIGERATORS APPROVED BY UNDERWRITERS' TESTS

REFRIGERATOR manufacturers have been consistent users of the facilities of the Underwriters' Laboratories, and the visitor to the laboratories building in Chicago will always find some refrigerators undergoing various tests. Practically all of the leading manufacturers avail themselves of the opportunity to have their products checked by this impartial authority.

The latest listing of appliances which have been tested for accident hazard at the Underwriters' Laboratories is dated October, 1930, and it devotes several pages to refrigerating machines, refrigerating systems and refrigerating appliances. The complete list follows:

REFRIGERATING MACHINES

[Household type, N. F. P. A. Class C equipment]

Fire and Accident — Re-examination Service

Absopure Refrigeration Corp., Detroit, Mich.: "Absopure"—Compression type (air or water cooled), employing 2 to 15 lbs. of methyl chloride, a flammable gas, as refrigerant. For use with one cooling unit. Compressor driven by automatically controlled electric motor.

Marking—"Absopure," name and address of manufacturer, Type "B," "C," "E," "F," "H," or "I" on name plate secured to compressor base.

Copeland Products, Inc., Mt. Clemens, Mich.: "Copeland"—Compression type (air or water-cooled). Compressor driven by automatically controlled electric motor. For use with one cooling unit. "Type 1" employing a maximum of 1½ lbs. of freezol (isobutane, a flammable gas), as refrigerant. "Types 2 and 3" employing a maximum of 6 lbs. of methyl chloride (a flammable gas), as refrigerant. "Type 4" employing 5 lbs. methyl chloride, a flammable gas, as refrigerant.

Marking—Name and address of manufacturer on name plate, Types 1, 2, 3, or 4, on separately attached plate.

Electrolux Servel Corp., Evansville, Ind.: "Electrolux"—Absorption type (water-cooled), Types "WG75" and "WE75," employing 1.62 liters acqua ammonia, specific gravity 0.885 at 15° C. and 4.25 liters hydrogen at 16 atmospheres; Types "WG50" and "WE50" employing 1.65 liters acqua ammonia, specific gravity 0.885, and 4 liters hydrogen at 200 lbs. pressure, as refrigerant and inert gas. Heated by automatically controlled gas burner or electric heating element.

Marking—"Electrolux," Type "WG75," "WE75," WG50," or "WE50," and name and address of manufacturer on compressor name plate.

Frigidaire Corp., Dayton, Ohio: "Frigidaire"—Suitable for use with one cooling unit. Compression type (air or water cooled), employing 15 lbs. or less of sulphur dioxide (a non-inflammable gas) as refrigerant.

Marking—"Frigidaire," serial number, and Model A, AO, AS, B, BP, C, D, EF, EFS, EW, EWO, F, FE, FS, K, KS, N, O, P, SC, Y, or YO on name plate.

General Electric Co., Schenectady, N. Y.: "General Electric"—Compression type (air-cooled), employing not more than 10 lbs. of sulphur-dioxide, a non-inflammable gas, as refrigerant. Compressor driven by automatically controlled electric motor.

Marking—"General Electric," Types DR-1, DR-2, or DR-3, and motor rating on name plate attached to compressor base.

Iceberg Mfg. Co., Gardner, Mass.: "Iceberg"—Household refrigerating machine and water cooler, compression type, air-cooled, employing 2 lbs. of methyl chloride, a flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. For use with one cooling unit.

Marking—"Iceberg," address of manufacturer, and letter "U" as prefix to model number, on name plate secured to compressor frame. Motor rating on motor name plate.

Icemaster Co., Haverhill, Mass.: "Icemaster"—Compression type (air-cooled), employing 4 lbs. of methyl chloride, a flammable gas, as refrigerant. Suitable for use with one cooling unit. Compressor driven by automatically controlled electric motor.

Marking—"Icemaster," "Type M1B, M2B, or M2R," serial number and name and address of manufacturer on compressor base.

Kelvinator Corp., Detroit, Mich.: "Kelvinator"—Compression type (air or water-cooled), employing not more than 8 lbs. of sulphur dioxide, a non-flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. Suitable for use with one cooling unit.

Marking—Name and address of manufacturer and Model "AA," "AJ," "AS," "AF," "AFE," "WF," "AH," "WH," "AK," "WB," "D," or "T" on compressor name plate.

Liberty Tool & Gauge Works, Inc., Providence, R. I.: "Liberty"—Compression type, air-cooled, employing 2 lbs. of methyl chloride, a flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. For use with one cooling unit.

Marking—"Liberty" and name and address of manufacturer, Type L-6, L-8, or L-10 on name plate secured to compressor base. Motor rating on motor name plate.

Norge Corp., Detroit, Mich.: "Norge"—Compression type (air-cooled), employing 15 lbs. of sulphur dioxide, a non-flammable gas, as refrigerant. For use with one cooling unit. Compressor driven by automatically controlled electric motor.

Marking—"Norge," "Model 320," "500," "675," "1000," or "2000," serial number, and name and address of manufacturer on plate attached to compressor base. Motor rating on motor name plate.

Savage Arms Corp., Utica, N. Y.: "Savage"—Mercury refrigerating machine, for use with one ice cream cabinet of compression type, air-cooled, employing not more than 10 lbs. of methyl chloride, a flammable gas, as refrigerant. For use with one cooling unit.

Marking—"Savage," Models 17 or 18, and serial number on compressor enclosure and motor rating on motor name plate.

Servel Inc., Evansville, Ind.: "Servel"—Compression type, air-cooled, employing a maximum of 6 lbs. of methyl chloride, a flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. For use with one cooling unit.

Marking—"Servel" Model Nos. 21A, 22A, 23A, or 24A and serial number on compressor base name plate.

Universal Cooler Corp., Detroit, Mich.: "Universal Cooler"—Compression type, air-cooled, employing 3 lbs. methyl chloride, a flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. Standard when connected to only one cooling unit.

Marking—"Universal Cooler" Model B, serial number and name and address of manufacturer on compressor unit base. Motor rating on motor name plate.

Wayne Home Equipment Co., The, Ft. Wayne, Ind.: "Wayne"—Compression type, air-cooled, employing sulphur dioxide, a non-flammable gas, as refrigerant. Suitable for one cooling unit. Compressor driven by automatically controlled electric motor.

Marking—"Wayne," Type "A-1," "A-2," "C-1," "C-2," or "F-1," and name and address of manufacturer on compressor base.

Welsbach Co., Gloucester, N. J.: "Welsbach" — Compression type, air-cooled, employing 20 oz. of ethyl chloride, a flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. Equipment suitable for one cooling unit.

Marking—"Welsbach," name and address of manufacturer, serial number and type numbers C-1, S-1, C-2, S-2, or S-25 on compressor base.

Westinghouse Electric & Mfg. Co., Mansfield, O.: "Westinghouse"—Compression type, air-cooled, employing maximum 1 lb. sulphur dioxide as refrigerant. Compressor driven by automatically controlled electric motor. For use with one cooling unit.

Marking—Name and address of manufacturer, Type SD-12 or SD-16 and electrical rating on name plate.

Williams Oil-O-Matic Heating Corp., Bloomington, Ill.: "Ice-O-Matic"—Compression type, air-cooled, employing from 4 to 13 lbs. of methyl chloride, a flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. For use with one cooling unit.

Marking—"Ice-O-Matic" and address of manufacturer, Type A or B and electrical rating on name plate.

Zerozone Corp., Chicago, Ill.: "Zerozone" — Compression type, air-cooled, employing 4 lbs. or less of sulphur dioxide, a non-flammable gas, as refrigerant. Compressor driven by automatically controlled electric motor. Suitable for use with one cooling unit.

Marking—"Zerozone," "Model A, S, or T," and serial number on compressor base.

REFRIGERATING SYSTEMS

[All equipment and installation specifications comply with the N. B. F. U. Code requirements. Standard when installed in accordance with N.B.F.U. Code for Multiple Systems.]

Fire and Accident — Re-examination Service

Copeland Products, Inc., Mt. Clemens, Mich.: "Copeland"—Multiple unit system, suitable for installation where more than one cooling unit is operated by a single compressor. One hundred pounds or less methyl chloride acrolein mixture, containing not more than 1.0 per cent nor less than 0.6 per cent by volume of acrolein, employed as refrigerant.

Marking—Name and address of manufacturer on compressor name plate. Type 2 or 4 on separately attached plate.

Frigidaire Corp., Dayton, Ohio: "Frigidaire"—Multiple unit system suitable for installation where more than one cooling unit is operated by a single compressor. 100 lbs. or less sulphur dioxide, a non-flammable gas, employed as refrigerant.

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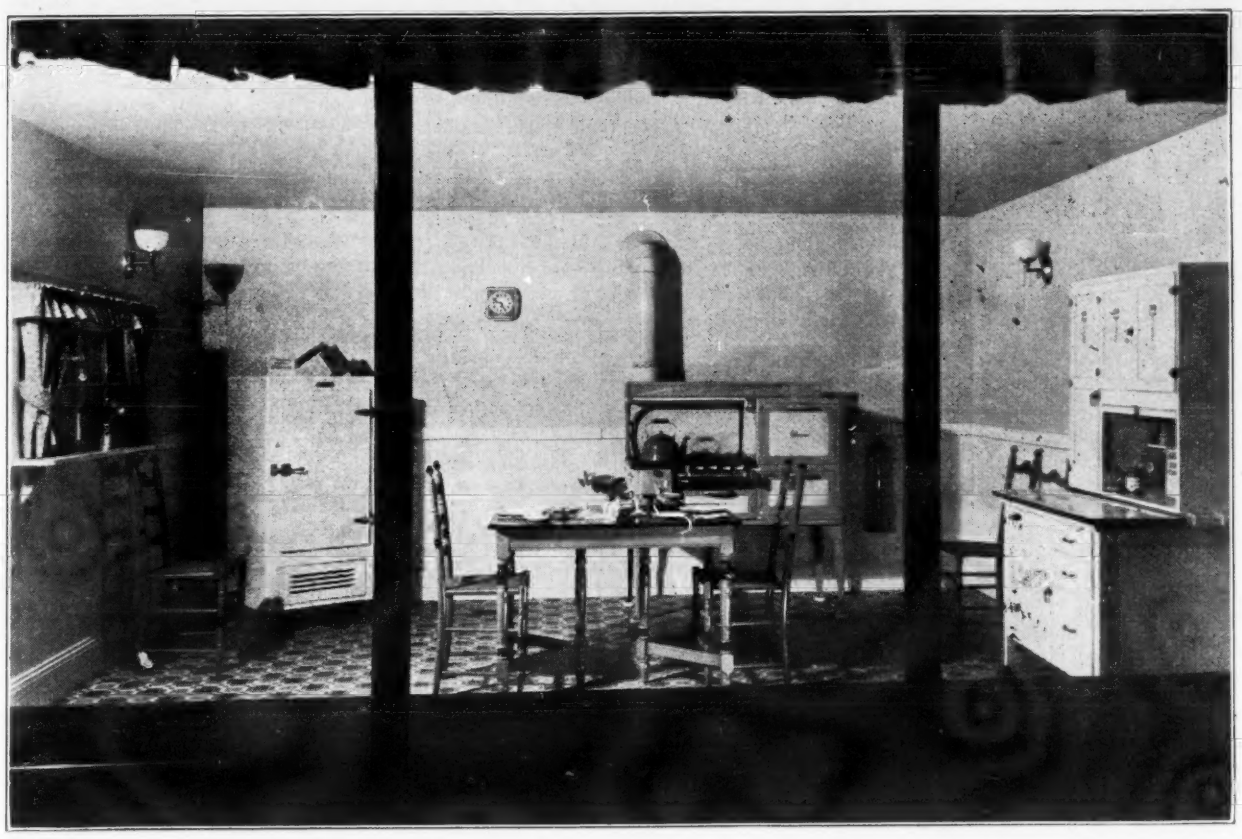
And Its Modern Counterpart



as may be seen in the left background, an up-to-date Electrolux. In every detail the kitchen was attractively arranged and furnished. It was just the sort of room that the average housekeeper of today would like to have, and it proved a most effective magnet to feminine passers-by.

The two kitchens furnished vivid and interesting contrast. Acknowledgments to the various companies which had cooperated in the displays were made over the Shell morning radio broadcast. Electrolux came in for a hearty share of the publicity.

GENERAL ELECTRIC GOES ON PARADE

New York, N. Y.—A General Electric refrigerator float was entered in a recent automobile parade held in Newburgh, N. Y. The Highlands Electric Company, Newburgh dealers, decorated the float with the General Electric orange and blue and with corn-husks and pumpkins. The display received enthusiastic plaudits from the townspeople.

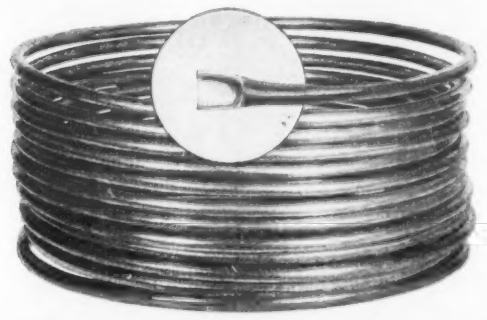
Similar decorations were used by the dealer for a window display in connection with the Fall Style Show at Newburgh, N. Y.

WE BUY
New and Used **ELECTRIC REFRIGERATORS**
In Any Condition
Phone, Write or Wire All Details, Type of Motor, Size of Box, Etc.
KASKEY & QUINN, Inc.
525 Arch Street Philadelphia, Pa.

The Purest Sulphur Dioxide
EXTRA DRY
Made by our exclusive patented process. **ESOTOO** Pure, easy to handle, does not deteriorate.
Trade Mark Reg. U. S. Patent Office
Made expressly for refrigerating use. Analysis guaranteed to show not over 50 parts of moisture per million.
Carried in stock by our Agents everywhere. Write or wire us where we can serve you.
VIRGINIA SMELTING CO. ◆ ◆ West Norfolk, Virginia
F. A. EUSTIS, Secretary 131 State St., Boston, and 75 West St., New York

DEHYDRATED WOLVERINE SEAMLESS COPPER TUBING

Highest quality seamless copper tubing—perfectly dehydrated and solder-sealed—made to A. S. T. M. Specifications (B-68-30-T)—ready for quick installation. Send your production requirements for quotations, or wire for rush shipment from stock.



WOLVERINE TUBE CO.
SEAMLESS COPPER BRASS & ALUMINUM
1491 Central Ave. Detroit, Mich.
Phone Cedar 5000
Export Department—H. M. Robins Company, 120 Madison Avenue, Detroit, U. S. A.
Cable Address: Robns. Detroit
Sales offices in all major cities. Stock available at Los Angeles.. 224 E. 11th St. Write or wire for name of nearest representative

Protect! your Nose Throat Lungs from Sulphur Dioxide (SO_2) Fumes

Use the PULMOSAN CHEMICAL CARTRIDGE RESPIRATOR

. . . . the choice of leading refrigeration companies and dealers.

Small—Light—Convenient—SAFE!

Clip this Coupon for Full Information.

PULMOSAN SAFETY EQUIPMENT CORP.
176 Johnson St., Brooklyn, N. Y.
Gentlemen: Send us full information on your No. 53 Mouthpiece Canister Respirator.
Name.....
Address.....
(E. R. N.)

(Concluded from Opposite Page)

Marking—"Frigidaire," serial number, and model A, K, Y, O, N, C, or D on compressor name plate.

Norge Corp., Detroit, Mich.: "Norge"—Multiple unit system suitable for installation where more than one cooling unit is operated by a single compressor. 100 lbs. or less sulphur dioxide, a non-flammable gas, employed as refrigerant.

Marking—Name and address of manufacturer on compressor name plate and instruction posters.

Servel, Inc., Evansville, Ind.: "Servel"—Multiple unit refrigerant distribution system comprising iron pipe low-pressure line inside which is copper tube high-pressure line; junction boxes, valves; flexible tubing and sheet metal shields for protection of tubes to refrigerator box. For use with refrigerants not exceeding 500 lbs. per sq. in. on high side or 200 lbs. per sq. in. on low side of system, and with refrigerants which do not seriously affect the materials of the system. Regarded as providing protection equivalent to that contemplated by N. B. F. U. Code requirements.

Marking—Name and address of manufacturer on junction box plates.

Zerozone Corp., Chicago, Ill.: "Zerozone"—Multiple unit system for installation where more than one cooling unit is operated by a single compressor. One hundred pounds or less sulphur dioxide, a non-flammable gas, employed as refrigerant.

Marking—"Zerozone," serial number, and Model I, WI, J, WJ, K, WK, H, WH, T, or S on compressor name plate.

REFRIGERATING APPLIANCES

CONDUIT FOR REFRIGERATOR TUBING

Fire and Accident — Re-examination Service

Wiremold Co., The, Hartford, Conn.: "Wiremold" conduit, Cat. No. 1000, and fittings including coupling, Cat. No. 1001, bushing, Cat. No. 1002, one-hole strap, Cat. No. 1005, external elbow, Cat. No. 1018, internal elbow, Cat. No. 1017, flat elbow, Cat. No. 1011, offset connector, Cat. No. 1086, and kick-plate, Cat. No. 1087.

Marking—No marking used: design sufficiently distinctive for identification.

CONTROLS

Switches designed for use with electrically operated household refrigerating machines.

Fire and Accident — Re-examination Service

Automatic Re-Closing Circuit Breaker Co., The, Columbus, Ohio: "Ranco Control"—Temperature-actuated switch, designed for use with machines using ¼-h. p., 115-volt, or 30-volt, d-c., or ¼-h.p., 110-volt, or 220-volt, a-c., single phase electric motors.

Marking—Name and address of manufacturer on switch case, model numbers, "R" or "L" stamped on the bottom of the temperature control tube.

Bishop & Babcock Sales Co., The, Cleveland, Ohio: Temperature or pressure-actuated switch designed for use in the electrically operated refrigerating machines using 110-volt or 220-volt, ¼-h.p., d-c. or single phase a-c. motors.

Marking—Name and address of manufacturer and Types "A" or "NA" and rating: 115 volts, 6 amperes a. c.; 115 volts, 4 amperes, d. c.

Penn Electric Switch Co., Des Moines, Iowa: "Penn"—Temperature or pressure-actuated switch, using ½-h.p., 115 or 220-volt, d. c., or 1-h.p., 110 or 220-volt, single phase, a. c. motors.

Marking—Name and address of manufacturer, Types, E, L, EA, or LS and rating on name plate.

Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.: "Tag Snap-On" pressure or temperature-actuated switch designed for use with electrically operated refrigerating machine. Type C-2 for 1-h p. a. c. and ½-h.p. d. c.

Marking—Name and address of manufacturer, type designation and electrical rating in horsepower on plate.

Time-O-Stat Controls Co., Elkhart, Ind.: Thermostatically operated mercury switch, Cat. Nos. 97 and 121, rating ½-h.p., d. c., 1-h.p. repulsion induction, Cat. No. 118, rating 1/6 h.p., a. c. or d. c. Cat. No. 149 designed for use with commercial refrigerating machines, rating ½-h.p., a. c. and d. c.

Marking—Cat. Nos. 97, 118, 121, or 149, rating in horsepower and trade name and address of manufacturer on cover.

COUPLING, REFRIGERANT LINE

Fire and Accident — Re-examination Service

Imperial Brass Mfg. Co., Chicago, Ill.: "Imperial Hi-Duty" brass coupling of compression type supplied to fit all standard size or extra heavy tubing. For use in connecting refrigerant lines up to ⅝-in. sizes.

Marking—"Imperial Hi-Duty" on carton.

Weatherhead Co., The, Cleveland, Ohio: "Weatherhead" couplings of inverted flare type for connecting refrigerant lines of refrigerating systems. Made in 1/4, 5/16, 3/8, 1/2 and 5/8-in. sizes.

Marking—The inverted flare identifies the fitting.

TUBING, REFRIGERANT LINE

Fire and Accident — Re-examination Service

Bundy Tubing Co, Detroit, Mich: "Bundy"—Rolled tubing made from strip copper, strip brass, and copper-coated strip steel for use on household refrigerating equipment. Made in 1/8, 3/16, 1/4, 5/16, 3/8, and 1/2 in. sizes.

Marking—The seam readily identifies the tubing.

VALVES, REFRIGERATING

Fire and Accident — Re-examination Service

American Radiator Co., Chicago, Ill.: Mfd. by Detroit Lubricator Co., Detroit, Mich. "American Thermostatic Expansion Valve"—Consists of needle type expansion valve, actuated by thermostatic power element. Designed for use on refrigerating systems.

Marking—"American Radiator Co." and type number "663-M" stamped on cover.

Clifford Mfg. Co., Boston, Mass.: "Clifford Packless" valve—Designed for use with refrigerating systems. Construction complies with N. B. F. U. Code requirements for multiple refrigerating systems.

Marking—Name of manufacturer cast in body and Model T.

Mueller Brass Co., Port Huron, Mich.: "Mueller" packed and packless valves with forged brass bodies. Designed for use with refrigerating systems. Made in Types A, B, C, D, and E, and sizes from ¼ to ⅝ in.

Marking—Name of manufacturer and type designation formed on body.

EFFICIENT OIL BURNER WILL HELP SALES CURVE

Cleveland, Ohio—Neatness of installation, permanency of adjustments, and dependability of ignition, in addition to operating efficiency, are points that should be carefully considered in selecting an oil burner, according to C. H. Foulds, sales manager of the oil burner division of the Perfection Stove Company, Cleveland, Ohio.

"These points are no less important to the dealer in determining what burner to sell than they are to the consumer in deciding what burner to buy," says Mr. Foulds.

The Perfection Stove Company is the maker of oil burners of the rotary type, bearing the trade name New Perfection—a name known to users of oil cook stoves and oil-burning water heaters, which the company has been manufacturing for the past forty years.

A vertical shaft motor, which is placed in the ashpit of the furnace or boiler, is employed in this burner to gain neatness. The only visible parts are the controls.

The burner is constructed of pressed metal throughout, riveted and welded together. No cast iron is used. A cup, pressed out of heavy sheet brass, picks up the oil; and air for combustion is supplied by a fan mounted on the atomizing cup. The air is drawn through a tube and over the motor, which the air keeps cool. This rotating cup and fan forces the air, and sprays the oil across the hearth, where it is gasified and burned. Aside from the motor itself the rotating part consists only of the atomizing head—head and motor forming a single unit.

Quietness is secured by having only one moving part, with no gears, chains or belts.

Ignition is either gas or electric. The gas pilot is of the expanding type, while the burner with electric ignition uses a special electrode, thus providing positive ignition.

The Perfection Stove Co. is also the manufacturer of the Superfex oil-burning refrigerator, which is operated by the heat from kerosene, and is designed for use in rural communities, where electricity is not available.

One Cent's Worth

INTERESTING figures were prepared by the statisticians of the Wisconsin Power & Light Co., Madison, Wis., showing how long an appliance can be operated on one cent's worth of electricity in Wisconsin.

For one cent they found that an electric refrigerator can be operated for three hours; or a 75-watt radio for one hour and forty-five minutes. Heat a toaster for twenty minutes or heat a waffle iron for twenty minutes. Light a 50-watt lamp for two hours and thirty-five minutes. The statisticians proclaim that the above figures were based on average appliances used, although they are subject to change according to the wattage used and the rate charged.

KELVINATOR RUSHES NEW LITERATURE TO DEALERS

Detroit, Mich.—When Kelvinator distributors departed from this city a short time ago with the slogan "Full Speed Ahead" deeply imbedded in their minds, they also carried back to their respective territories Kelvinator's sales promotion material for 1931. Shortly before the annual convention, the sales promotion department put on full steam and sailed "full speed ahead" on the job of getting the material ready for distribution. The distributors and field men were all given copies of literature which is pictured on this page.

Kelvinator's merchandising plans are outlined in the plan book entitled "Full Speed Ahead." In this book, Kelvinator unfolds its national magazine advertising program to support the 1931 line. Outdoor and newspaper advertising, radio advertising and advertising in special fields in business and trade publications for 1931 are also fully covered. The augmented activity of the sales promotion department with its sales helps is also taken up in detail.

Window Displays

In "Now Sales Help at the Point of Sales for all Kelvinator Dealers" the problem of making the window display pay the big portion of the rental is squarely faced. Here Kelvinator discusses its plan for monthly displays, available to dealers at low cost.

To keep salesmen hot-footing after orders and pepped up at all times is the thought in the "Book of Contests." Fifty-two contests, with the proper method of procedure, are presented for the benefit of retail and wholesale sales managers.

Maintenance of a domestic department organization is outlined in a clear and concise manner in the pamphlet "Organization and Operation of a Domestic Department." Likewise, another pamphlet takes up "Organization and Operation of a Builder Department and Apartment House Division."

"Kelvinator Users' Co-operative Selling Plan" discusses how Kelvinator users who turn in names of prospects may receive valuable awards.

Special displays for fairs, showroom, convention, etc., are illustrated in "Kelvinator Displays." Valuable hints concerning location, equipment, arrangement, decorations, illumination, furnishings, literature, souvenirs or novelties, etc., are offered to dealers.

Kelvinator Sales Slants is published monthly, and each issue contains topics designed to help the dealer and distributor.

In its "Handbook of Electric Water Cooling," Kelvinator has compiled data to assist the architect, engineer and contractor to specify and select water-cooling equipment.

Acknowledgment Cards

Acknowledgment cards are to be used by dealers and distributors to thank Kelvinator users for turning in names of prospects in accordance with the Co-operative Users' Plan.

How to sell Kelvinator refrigeration to landlords is the subject of one of the sales helps. It outlines how to check up and locate flats or homes which are not equipped with electric refrigeration.

For landlords who have not equipped their places with electric refrigeration, Kelvinator has the booklet, "How You Can Get Bigger Rents and Better Tenants." It is prepared to convince landlords that electric refrigeration is a necessity in securing desirable tennants quickly.

Two small folders round out Kelvinator's sales promotion literature for 1931. One presents the products that make up the domestic line, and the other the commercial equipment.

REQUESTS FOR INFORMATION

Readers who can be of assistance in furnishing correct answers to inquiries, or who can supply additional information, are invited to address Electric Refrigeration News, mentioning query number.

Winters & Crampton

Query No. 390—"We should like to obtain the address of Winters & Crampton, manufacturers of refrigerator hardware, but so far have been unsuccessful in our attempts to get their address. We would appreciate it very much if you would supply us with the same."

Answer—Winters & Crampton Manufacturing Co., Grandville, Mich.

Cooling Coils

Query No. 391—"Please send us a list of manufacturers making various types of cooling coils and tanks."

Compressors

Query No. 392—"As we are very seriously considering the assembling of component parts of electric refrigerators, we are particularly anxious to learn who are manufacturers of high grade compressors."

"Full Speed Ahead"

Kelvinator's Array of 1931 Sales Promotion Material

LITERATURE OF MANUFACTURERS

Catalogues, bulletins and other material recently issued.

Manufacturers are requested to send copies of new trade literature to Electric Refrigeration News.

Drayer & Hanson

Automobile truck bodies for transporting food products are illustrated and described in detail in the latest catalog put out by Drayer & Hanson, Inc., Los Angeles, Calif. D. & H. refrigerator bodies are designed for handling ice cream, dairy products, meats and other perishables.

Lipman

Commercial refrigeration is the theme of a folder prepared by the General Refrigeration Co., Beloit, Wis. Twelve new models that make up the Lipman line are covered in detail. Ten of the machines are of the self-contained type. All models can be had with either automatic or manual control.

Makepeace

Information concerning gold and silver solders has been compiled by D. E. Makepeace Co., of Attleboro, Mass., in a small booklet. This booklet contains instructions for soldering, such as cleaning, fluxing, blow torch soldering and electric soldering machines. Considerable space is devoted to the subjects, meeting temperatures of solders and advantages of silver and gold solders.

Robbins & Burke

Refrigerator truck bodies designed for either mechanical, ice and salt, cartridge and Dry-Ice refrigeration are covered in a new catalog issued by Robbins & Burke, Inc., Cambridge, Mass. R. & B. mechanical refrigerator bodies are built in sizes from 200 gallon to 2,000 gallon capacity.

Vilter

A series of nine bulletins has been released by the Vilter Mfg. Co., of Milwaukee, Wis. These bulletins describe Vilter refrigerating machinery and equipment. Bulletin No. 229 covers vertical, twin-cylinder ammonia compressors; No. 230 Vilter ammonia refrigerator; No. 329 multi-state compression for low temperatures; No. 330 operating instructions for vertical ammonia compressors; No. 530 economy valve for automatic control of ammonia feeds; No. 829 vertical shell and tube condensers; No. 929 horizontal multi-pass shell and tube condensers; No. 1029 raw water ice plants, and No. 1129 shell and tube brine coolers.

HOTEL EQUIPPED

Mobile, Ala.—Quigley's, local Frigidaire dealer, recently completed installation of a unit in the Halin Hotel, which has reopened.

The Expansion Valve

By GEORGE F. TAUBENECK

"That's fine," he beams. Short, broad-shouldered, deep-chested, square-faced, and soft-voiced, E. G. Biechler, Frigidaire's president, is a bundle of paradoxes.

From a distance one watches him speaking and gesturing, and opines him to be vigorous, forceful, and hard. Upon approaching him and hearing him talk, he becomes the most disarming fellow imaginable. He is as pleasant and charming as Maurice Chevalier, idol of countless feminine cinema addicts, and possesses the enviable faculty of radiating warmth.

"That's fine!" is his favorite expression. And one can't help but believe he means it.

Somehow one doesn't expect an executive in a General Motors organization to be so human and appealing. Pictures of G. M.'s President Sloan—tall, gaunt, lined, sober as the proverbial judge—seem more typical than the warmly jovial Mr. Biechler.

General Motors Vice Presidents Pratt and Kettering, however, are fully as surprising in appearance. Mr. Pratt, who looks after all the G. M. subsidiaries, is as unassuming as a small-town grocer.

He looks for all the world as if he had just stepped out from behind the corner of the Binks General Store and Farm Implement Emporium. One perceives in his keen glance, however, that he sees and understands with extraordinary facility and felicity.

Famed Charles F. Kettering, the genius who is really the father of the modern automobile, is also of unimposing mien. When he begins to talk, however, shining new vistas of undiscovered territories are spread out before you. His thinking and imagination run in channels which nobody else ever dreamed existed.

The above-mentioned three celebrities, along with a raft of other notables, were all on exhibition at the elaborate dinner given to Winston Paul by the Frigidaire Corp. on the roof of the Astor hotel, in New York City, not long ago.

Also in Manhattan at that time were Frigidaire's two ambassadors, Advertising Manager E. D. Doty, and C. T. Mutchner, who handles the publicity for the organization. As the gentlemen-who-meet-the-public, these two men have an ideal physical set-up and manner.

Both are tall, suave, and distinguished-appearing. They are apparently at ease anywhere, and have enough polish to substitute for H. R. H., the Prince of Wales. Doty, in particular, looks like our idea of an English lord.

At the multi-course banquet for Mr. Paul, who is relinquishing the New York distributorship for Frigidaire after nine years of service, was a solemn-visaged individual who was introduced as "Senator" Ford from Michigan.

This owlish speaker kept the throng present holding sore sides caused by rocking laughter for more than half an hour. Among his cracks:

"Like the two-year-old Buick, I'm swelling with pride over the honor of appearing before you illuminated celebrities."

"The 16-cylinder Cadillac has a real pick-up. We picked up three blondes and a brunette in one block with one this afternoon."

"I was brought here tonight as a freak to be placed on exhibition. I own a Frigidaire, and what's more, I paid cash for it. Mr. Biecher thought you ought to see what a cash customer looks like."

"You have sold, I hear, more than a million Frigidaires. Just think, only 27 million more and you'll tie Vick's Vaporub!"

A few weeks ago the Expansion Valve related some yarns about police dogs being taken in as down payments on refrigerators. Somehow we expected those tales would evoke others, and so they did. H. W. Beddoe, from the commercial division of the Frigidaire Sales Corp. 'way out in Los Angeles, Calif., writes us the following:

"Several years ago, while I was in the domestic division, the first refrigerator I ever sold was bought on the proposition that I take a French bulldog puppy as down payment.

"I took the pup and allowed $25.00 for it. Within one week I had sold the pup for $50.00 and received a letter from the purchaser thanking me for sending him a better dog than he expected to receive. He has since refused $200.00 for this dog."

MOISTER, D'ARCY ADDED TO WESTINGHOUSE STAFF

Mansfield, Ohio—Expansion of the refrigeration department of the Westinghouse Electric and Manufacturing Company has resulted in two new appointments by Carl D. Taylor, manager of the department.

George W. Moister, formerly vice president and general manager of Kelvinator-Philadelphia, Inc., has been named manager of sales promotion in charge of refrigeration advertising and retail sales development.

H. A. D'Arcy, formerly Western manager of utilities sales with the Kelvinator Sales Corporation, Detroit, has been made central station sales supervisor in charge of central station refrigeration sales activities.

Mr. Moister has one of the longest records of sales activity in the electric refrigeration field, and has been with the Kelvinator Corporation for the last seven years. He handled various territorial sales activities, sales promotion and special sales development work on both the Atlantic and the Pacific coasts. He is a former Westinghouse man, having left the Westinghouse Lamp Company plant in Indianapolis in 1923 to enter the electric refrigerator field.

Mr. D'Arcy was identified with central station activities of Kelvinator from 1926. His acquaintance in that field is very extensive, having contacted practically every major operating and holding company in the United States.

LOVEGREN NOW ZEROZONE SALES MANAGER

Chicago, Ill.—E. R. Lovegren, for the last four years assistant general sales manager of the Zerozone Corporation, has been advanced to general sales manager, succeeding L. C. Keely, who has taken charge of the Chicago territory for the Seeger Refrigerator Co.

THE CONDENSER

ADVERTISING RATE fifty cents per line (this column only).

SPECIAL RATE if paid in advance — Positions Wanted — fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each. All other classifications—fifty words or less, one insertion $3.00, additional words six cents each. Three insertions $8.00, additional words sixteen cents each.

POSITIONS WANTED

SERVICE and Installation Manager available. Three years' electrical experience. Seven years with one Frigidaire dealer; has working knowledge of other machines; also experience in Household and Commercial Sales. Student Utilities Engineering Institute, Chicago. References supplied. Box No. 295.

TRAVELING sales manager, experienced in organization and training of electric refrigeration dealers and salesmen, preparation of promotion plans and material. Available December 1. Prefer middle west. W. E. Harber, 133 McKinnie Ave., Ft. Wayne, Ind.

MISCELLANEOUS

CASH: For discontinued stock of low pressure automatic refrigerating compressors and coils. Submit full description, prices, etc., to Box 290.

WANTED—Servel units for cash No. 1, No. 8, No. 15, No. 21, No. 22-A. Boxes and tanks not wanted. State price and full details. Box 288.

FLEXO Trays, Frigidaire sizes, on hand, 30-12 cube; 22-21 cube; 34-24 cube. In original cartons. F. O. B. Philadelphia, Pa. Best offer takes the lot. Rippien Company, Jenkintown (Montgomery County), Pa.

FOR SALE: We will sell at a very attractive price whole or parts of the following: Larkin Coils, Zerozone Coils, Ebco Water Cooler and Zerozone Electric Signs. For list and prices of materials communicate with THE ELIN COMPANY, 330 Washington Street, Newark, New Jersey.

Be An EXPERT in ELECTRIC REFRIGERATION

Learn at home new easy way. Oldest, largest home study electric refrigeration school offers thorough, practical training, endorsed by Servel, Kelvinator, Copeland, Zerozone, and other leading manufacturers. Wonderful pay-raising opportunity for service men; practical help to dealers, salesmen, manufacturers. Special proposition to firms who wish to train staffs. FREE BOOK explains everything. No obligation. Utilities Engineering Institute, Dept. 4110, 4403 Sheridan Road, Chicago, Ill.

Refrigerators Tested • Both Ice and Mechanical Refrigerators Tested for Performance in our Refrigerator Laboratory. This service is unique for the Manufacturer or Distributor.

We invite your inquiries.

George B. Bright Co.
Refrigerating Engineers and Architects
2615 12th Street, Detroit

PATENTS

Secured for inventions relating to Refrigeration, Electrical Apparatus and Treatment and Handling of Foods and other important subjects.

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27 Colorful Pieces for $20

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Refrigerated Food Section

In Three Parts—Part 2

ELECTRIC REFRIGERATION NEWS

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OBJECTIONS

To Frozen Meats Voiced by Omaha Butchers

Omaha, Neb.—Although they are citizens of a meat packing center, the retail meat dealers of Omaha, or at least their spokesmen, do not seem to relish quick-frozen meats. Even the presence of the Cudahy Packing Company in South Omaha, which is putting out an extensive line of quick-frozen products, has not served to allay the fears of the Omaha butchers.

In a recent interview on the subject of quick-frozen meats, J. J. Cameron, executive secretary of the Omaha Retail Meat Dealers' Association, brought forth all of the stock arguments against the new products which are proving so successful wherever they have been marketed, and which give to the retail meat merchant the best opportunity he has had in years to modernize his business and add a note of novelty to his all too familiar surroundings. Mr. Cameron prefaced his remarks by stating that the members of his association will not handle quick-frozen products, thus indicating a willingness to leave this promising field wide open to their competitors.

"Of course," Mr. Cameron said, "that is modified to this extent. The public must first indicate, to such an extent that it will prove profitable, the desire for this service. We know it has been broached in Omaha, but many turned it down. A very few were induced to buy a quantity, yet lacked the nerve to try the sale in Omaha. So far as I know there has not been a pound of this 'quick-frozen' or so-called 'fancy cut meats' offered the public through any retail meat dealer of the city.

Timid Housewives?

"One big thing that has not yet been overcome is the fact that housewives have the opinion the frozen meat loses a portion of the natural flavor. We believe that, and more proof than has been shown yet will be necessary to remove the doubt. The American people have ever had the best on the market as far as meats are concerned, and it is going to take a miracle to induce a change. Possibly it might be more convenient for the barber or the news dealer to sell the meats, yet could they do it? Would the housewife patronize Tom, Dick and Harry when it came to purchasing meats? Assuredly not. Careful selection of meats has been the pride of the women of America and that privilege is not to be surrendered so easily.

"Then again these meats just cannot be sold here under the present rules of sanitation. It is one of the requirements that all meat must be removed from the display cases every night and not again exposed in the cases. That would make it impossible to handle these meats, as all unsold at the close of any day would be a loss, and bankruptcy would face the meat dealer in a very short time.

"Neither can I see," continued Mr. Cameron, "any gain in business for delicatessen shops. In the first place, I do not think it possible for them to successfully handle fresh meats in any form without cutting in deeply on the sale of other goods. In the second place the minute they do place these meats on sale the shops will be forced, under an ordinance now in force in Omaha, to close shop either Saturday or Sunday. The one-half of the business of delicatessens in Omaha is the proceeds of Sunday, and operators would never give up the Sunday business just to gain a few doubtful dollars from the sale of 'quick-frozen meats.'"

Interviews with other dealers in Omaha showed there was a decided doubt in the minds of most of them as to the economy side of the frozen meat business. In speaking of this, Mr. Cameron stated: "We all know labor bills

(Concluded on Page 7, Column 2)

GOVERNMENT TO STUDY FISH HANDLING METHODS

Washington, D. C.—Improved methods for handling fresh fish will be studied by the United States Bureau of Fisheries at the Municipal Fish Wharf, here, Henry O'Malley, commissioner of the bureau, announced recently.

Two electric refrigerators, capable of holding foods at temperatures as low as 10 degrees below zero Fahrenheit, will be installed in the space allotted by the District Commissioners.

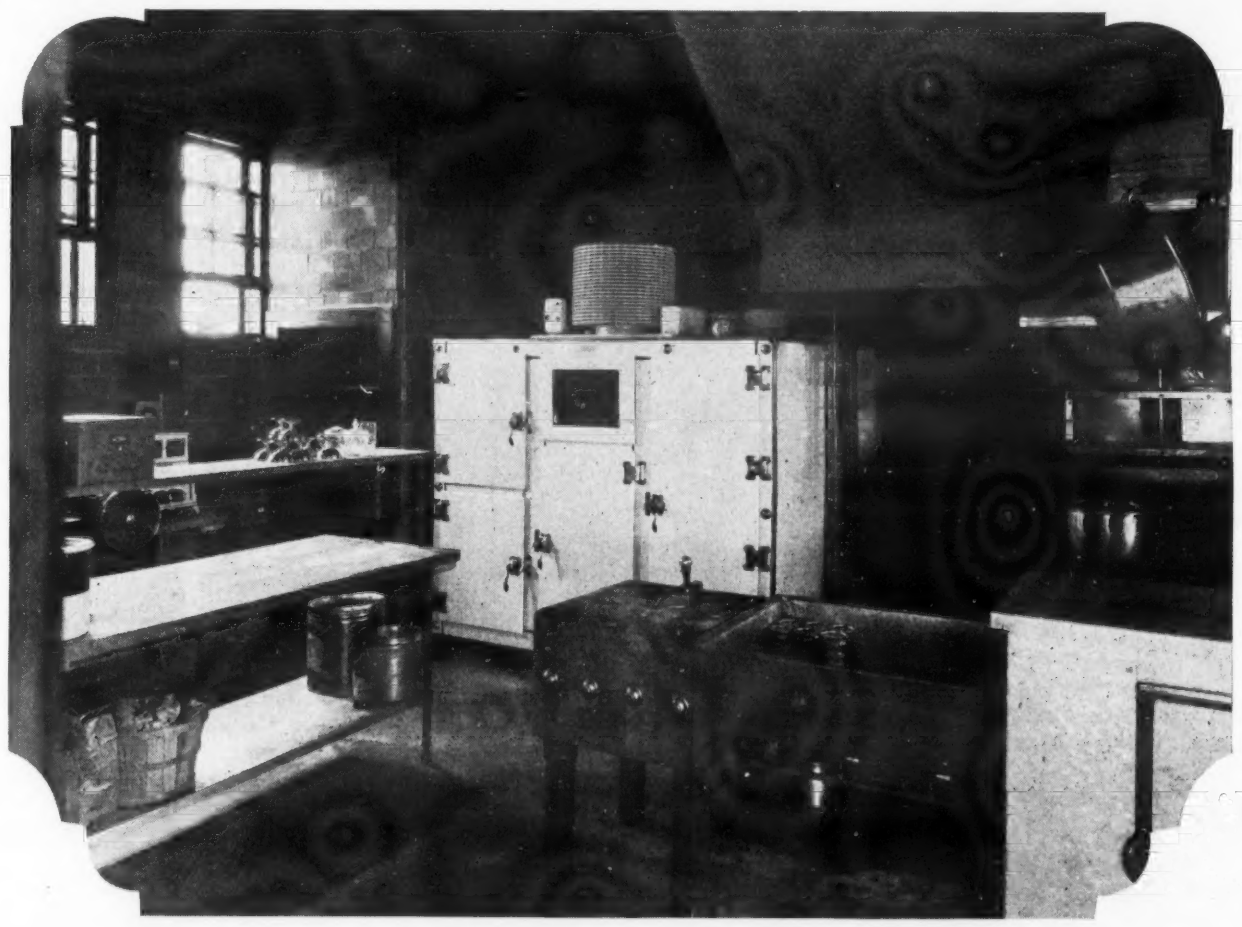
Low Temperature and Frozen Foods On A. S. R. E. Program

LOW temperature refrigeration and the quick-freezing of foods will be among the subjects discussed on the afternoon of Wednesday, December 3rd, at the opening session of the semi-annual meeting of the American Society of Refrigerating Engineers, which will be held at the Hotel New Yorker, New York.

The program for the Wednesday afternoon session includes the names of Paul Willar Petersen, who will talk on "Food Freezing as a Theory"; Professor Arthur W. Elweli, of Worcester Polytechnic Institute, whose subject will be "Ozone and Cold Storage Foods"; Frank Zumbro, of the Frick Company, "Recent Applications of Low Temperature Refrigeration"; and A. H. Cooper, University of Tennessee.

The other sessions of the Convention, December 4, 5 and 6, will be open to interested visitors, and the relations of low temperatures to the preservation of foods probably will crop up from time to time during the discussions. Even the refrigeration engineers find it hard to keep away from refrigerated foods these days.

Public Health



A big G. E. refrigerator is conspicuous in the Shelter House at Ault Park, Cincinnati.

LEADERS

To Speak at New York Meeting

New York, N. Y.—The New York Food Marketing Research Council, which held an open meeting last June at which quick-frozen meats were discussed pro and con by an unusually good list of speakers, is planning another meeting on Tuesday, December 9, at which quick-frozen fruits and vegetables will be the topic. An all-day meeting is planned, and it is possible that a luncheon composed of quick-frozen products will be served.

Although formal announcement of the complete plans for the meeting have not yet been made by Earl R. French, secretary of the Council, great interest has been shown and the meeting promises to attract an even greater number of interested listeners than attended the meeting last spring.

All of the speakers who have been invited have not yet been heard from, but the program already definitely lists Dr. C. A. Magoon, of the United States Department of Agriculture; W. R. Tucker, whose work with Georgia peaches has attracted nation-wide attention; H. W. Ullsberger, who is at the head of cherry freezing activities in Wisconsin and Michigan; C. V. Hill, of Trenton, N. J., veteran manufacturer of refrigerated cases; Marion Harper, vice-president of General Foods Sales Corporation, and William Jabine, editor of ELECTRIC REFRIGERATION NEWS.

C. C. Commander manager of the Florida Citrus Exchange, and W. B. Case, representing the cold pack interests in western New York, are among those who have been invited to speak but who have not yet accepted.

The New York Food Marketing Research Council is (to quote the statement in its own bulletin) "a co-ordinating, regional, research body devoted to public service in the way of developing and disseminating information relating to the receipt, sale and distribution of perishable food products in the Metropolitan New York district." The members of the Council in the order in which they joined are:

United States Department of Agriculture, Bureau of Agricultural Economics; The Port of New York Authority; New York State College of Agriculture; New Jersey State Agricultural College; Columbia University, School of Business; New York State Department of Agriculture and Markets; New York University, School of Commerce; Department of Public Markets, City of New York; Florida Agricultural Experiment Station, Department of Agricultural Economics.

All public agencies and educational institutions engaged in studies of marketing and distribution of foods in the New York market are eligible for election as members of the Council.

QUICK-FROZEN FISH SALES

New York, N. Y.—During 1929 and the first four months of 1930, the Atlantic Coast Fisheries sales figures were about $16,000,000. Of this amount, from $1,500,000 to $2,000,000 represents the sales of quick-frozen fish. Most of the quick-frozen fish has been haddock.

The experimental campaigns testing the public acceptance of quick-frozen fish steaks, which were begun recently in Syracuse, N. Y., and New Orleans, La., are making satisfactory progress.

OFFICIAL

Visitors Inspect "Z" Process

London, England—Col. T. Dunlop Young, Captain R. H. Haywood, J. Raymond, S. C. Lintott, C. A. Cawood, Mr. Blair, and others representing the British meat trade, recently made a visit to the "Z" Quick-Freezing Plant, situated in Fleetwood and operated by the Liverpool Refrigeration Co., Ltd.

Col. Young is head of the British Meat Inspection Department, Captain Heywood is official representative of the Australian meat trade, Mr. Raymond is Honorary Secretary of the British Association of Refrigeration, Mr. Lintott and Mr. Blair represent meat and refrigerating interests, and Mr. Cawood is a fish merchant of Hull. They carefully and thoroughly inspected "Z" quick-frozen meats, steaks and chops, offals, liver, kidneys, brains, and the like, as well as "Z" quick-frozen fillets and whole fish.

Attractive cartons, from ½ to 5 lb. capacity, the various products being packed in cellophane paper, impressed the visitors as an evidence of the oncoming evolution in the meat trade. Instead of bulky and wasteful transportation, as well as storage of whole meat carcasses or whole fish, they could easily visualize the time, perhaps next year, when all perishable food products, such as meat and fish, will be "Z" quick-frozen at the point of production in attractive, convenient and compact packages, in sanitary cellophane paper, sealed air-tight, and in such shape sent to the ultimate consumer.

An actual demonstration of quick-

(Concluded on Page 3, Column 2)

Snyder Asserts Faith In Quick Frozen Foods

His Testimony at Washington Hearing Brimful of Confidence

Washington, D. C.—Appearing before the Supreme Court of the District of Columbia on behalf of the packers, who are petitioning for modification of the famous Consent Decree barring them from entering the retail business, Frederick S. Snyder, chairman of the Board of the Institute of American Meat Packers, devoted a large part of his testimony to quick-freezing. Mr. Snyder, who is president and general manager of Batchelder, Snyder, Dorr & Doe, of Boston, the organization that has been freezing Birdseye Frosted Meats for the General Foods Corporation, expressed firm faith in the future of quick-frozen foodstuffs and predicted revolutionary changes in the methods of handling foods as a result of the development of quick-freezing. His testimony indicated that he has the utmost confidence in the new products.

His direct testimony, so far as it relates to quick-freezing, is printed herewith. In it he makes reference to a number of questions that are very much alive at this time, including the need for properly refrigerated cases, the possibility that the packers as producers of quick-frozen foods may help to finance the purchasing of refrigerated cases, and other moot points. Mr. Snyder, in qualifying as a witness, recited the positions which he now holds, his experience during the war as a member of the United States Food Purchase Board and as chief of the Meat Division, the Cold Storage Warehouse Division and the Division of Miscellaneous Commodities of the Food Administration, and the fact that he has been active in the food business for 43 years.

The hearing at which Mr. Snyder testified was held before Justice Jennings Bailey, and the questioner in the testimony printed below was Frank J. Hogan, counsel for the petitioning packers. That part of Mr. Snyder's cross-examination which relates to quick-freezing will be printed in the next issue of the Refrigerated Food Section.

Q. When we took the little recess a few moments ago, Mr. Snyder, I was directing your attention to inquiries that I desired to make respecting any new freezing process as applied to foodstuff, and I used the term "foodstuff" more generically than meaning meat. Is there a new process that is coming into vogue? If so, what is it called, and I wish you would describe its operations.

A. I think I can describe the impending development as new, so far as the process is concerned. Scientists have known for a number of years that the development of a microscopic ice crystal in flesh foods of all sorts had a very different effect upon the tissues than the ice crystal which is produced by ordinary freezing processes. The microscopic ice crystal properly developed is so small that many of them may occupy the space of a single cell in flesh food; but, even if it were so large that only a single one occupied it without damaging the cell, that again would be microscopic in character.

That process of quick freezing, so far as principle is concerned, has been the subject of a very, very considerable number of patents; but it has been only within the last few years, particularly within the last two years, that developments have occurred with sufficient rapidity so that it has become a matter of importance and consequence to the food industries of the country. Patents, both European and American, have been issued to half a dozen, and I do not know but a dozen, different inventors with respect to the preparation of foods by various mechanical processes which they have patented. In the last eighteen months attention has been particularly directed to it all over the world by events which have taken place in various parts of the world.

Some sixteen or seventeen months ago I visited Gloucester as titular chairman of a committee to investigate one of these processes. The committee consisted of a very considerable number of men; I think some seventeen in number; anyhow, a considerable number, who represented the Institute of American Meat Packers. They went there for the purpose of making a first-hand study of that particular process, which was known as the Birdseye Process; the

(Continued on Page 4, Column 3)

Zarotschenzeff Summarizes His Quick Freezing Process

European Inventor Describes Recent Work in England

A REFRIGERATION engineer with 20 years' practical work, manager of large cold storage and packing houses, and one of the pioneers of refrigeration in Europe, M. T. Zarotschenzeff, has perfected a quick-chilling and quick-freezing process than can be used both on trawler and on land. The basic idea of the process is fine pulverization of a certain brine solution. For quick chilling on trawlers ordinary sea water is being used. Aside from the basic idea of brine pulverization, the process represents rather a series or a cycle of processes. From the time fish are hoisted aboard to the time fish or fish products are delivered to the consumer, all the problems have been worked out.

The "Z" process is mainly based, omitting technical details and specific claims of the patent, on the principle of using atomized or finely pulverized refrigerated liquid. Liquid can be salt brine, or usually specially prepared (approved by Sanitation and Board of Health) salt solution, which is filtered and sterilized in special apparatus. The pulverization is effected by means of pressing liquid through special nozzles of specific designs, or atomizers. The chambers in which products are to be frozen, chilled or defrosted are thus filled with minute particles of refrigerated liquid. As particles are ejected at considerable velocity, there exists in the chamber circulation around the product. The heat conductivity of air, due to saturation with liquid, is increased manyfold. Surface contact of minute particles of liquid with the product is increased several thousand times as compared with simple immersion of the same product into liquid and circulating this liquid, in pulverized state, is much more effective (effectiveness is in direct proportion to the smallness of the particles, than with the same unit of same liquid remaining in fluid state). These manyfold actions of the process explain its great efficacy, efficiency, quickness of action, simplicity, and several other advantages which will be mentioned later on.

Due to the fact that the pressure around the product remains same as that inside the product (contrary to the situation with the immersion method), there is no fear of penetration of damage to the appearance of the product.

Practical experiments and actual installations in Europe have indicated that practically all food products that need chilling, freezing and defrosting can be treated by means of the "Z" Process. The "Z" Process will revolutionize the methods of preservation of fish at sea, meat on land, fruit, berries and other foodstuffs.

A few samples of the products frozen by the "Z" atomized brine process.

A brief summary of the process when freezing fish follows:

1. Right on trawler fish are washed by means of sprays of filtered sea water. A certain disinfectant may be added.

2. Fish are placed (in trays, metal or wooden boxes, crates, or any other suitable containers) into "Z" quick chiller. The chamber that is reserved for this purpose is filled with finely atomized cold sea water. This sea water passes first through a filter, then through a cooler, is chilled from, say, 50 degrees F. down to 28 degrees F. to 30 degrees F., is pressed, by means of a pump, to pulverizers—special nozzles—and is pulverized to chamber, thus effecting the chilling of fish from 50 degrees or thereabout to 32 degrees, taking out all latent heat, making it *hard chilled* but *not frozen*. Sea water collects in the bottom of the chamber and through a coil passes into the same system: filter, cooler, pump back to nozzle.

No Ice Needed

3. Chilled fish are stored—without ice—in insulated hold, with refrigeration coils along the walls and ceiling. To keep chilled fish in best condition, to prevent excessive drying, to provide proper ventilation, the "Z" quick-chilling principle is applied here in moderation, just to keep fish sweet and fresh.

4. There is no expense for ice. If fishing is poor, there is no loss of power or ice as at present. All fish on bottom, as on top, are good and of same quality. Handling is simplified as everything is roomier, no ice to shovel, dig or care for. Fish can be stored in one standard size basket or crate, chilled in it, stored in it, lifted three to four at a time in port (very good saving in labor), carried and transported in the same container.

5. Upon landing, the fish can be sold, frozen or stored as chilled fish. Using the same principle, fish can be stored in large insulated and properly equipped cold stores.

6. Quick freezing on trawlers is accomplished in the same way as quick chilling. Instead of 28 degrees to 30 degrees F., the temperature is reduced to minus 6 degrees F.

Additional washing and glazing by means of fine sprays adds to better finish of the product. A tunnel with a conveyor or freezer-cabinets can be installed and operated in such a way that after freezing fish are washed and glazed without extra handling.

Various Methods

7. Quick freezing can be done in a very efficient and labor-saving way on land. There are several plans: tunnels with overhead conveyors, cabinets into which fish are rolled on trucks, cages hanging from overhead rail, etc. The labor-saving phase of this end had been very carefully considered. The saving on labor alone will be one of the most important factors in considering the "Z" process.

8. "Z" quick-chilled fish, after storage in "Z" fresh cold storage, can be filtered. Fish fillets and steaks can be packaged, wrapped, put into various containers (we have a very large variety of containers to select from), and frozen by the same method. The freezing requires from 15 minutes to 45 minutes, depending on the temperature, thickness, kind of fish, etc.

9. Packaged fish fillets in ½ to 1 lb., etc., cartons, are placed in shipping cases of corrugated cardboard, sealed with tape, and then either stored in cold storage (temperature 10 degrees F.) or shipped to retailers and consumers.

This brief summary is mainly to show that every phase of fish preservation had been dealt with.

Practical experiments, actual installations in Europe have indicated that practically all food products that need chilling, freezing or defrosting can be treated by means of the "Z" Process.

In the meat industry there are still more revolutionary changes:

1. Chilling hog carcasses by the "Z" Process eliminates 2 per cent of ordinary shrinkage, thus producing more profit on finished product. The time necessary for chilling is cut from 24 hours to 6 hours. Turnover is increased four times. Again, there is an actual profit due to reduced floor space, investment, current expenses. The mechanizing of the whole process, which is a possibility, will reduce labor to a minimum. Finally, the product is better because it is fresher.

2. Chilling by-products, such as livers, kidneys, hearts, brains, etc. Instead of three days' turnover at least, it is possible to have turnover of one day only. A drastic reduction of labor results.

Less Freezing Space

3. Freezing hams, bellies and other meat cuts, for storage (seasonal storage). There is a reduction of from 4 to 10 times of freezing space, complete mechanization of the process, reduction of labor, gain in weight; 3 per cent of usual shrinkage is eliminated.

4. Freezing packages of meat cuts, such as chops, leafs, stews, steaks, etc. The most economical method for rapid freezing is the use of packaged products. (Twenty-five cents per 100 lbs. of frozen products, in contrast with 75 cents frozen by a very well known U. S. corporation.) Quality is just as good, in fact, better, than the best existing method of rapid freezing in the United States.

5. Other food lines, like produce: poultry, fluid eggs (eggs without shell frozen in containers), and milk can be frozen in record time.

Frozen poultry (geese, chickens, ducks) have been frozen by the inventor on a large scale and sold at a premium.

6. Berries, fruit and juices have been frozen in attractive containers, stored for six months, and found excellent.

7. Ice cream offers a very fertile ready market for the "Z" Process. The ordinary period of hardening of 36 hours is reduced to ½ or 2 hours. This problem presents such tremendous possibilities that the inventor devotes his present time towards the realization of commercial application of his process in the ice cream industry.

The General Advantages of the "Z" Process

1. Uniform standard and simple process throughout.
2. Rapid, reduces time element.
3. Cheap to install and operate.
4. Can be applied to any and every condition; apparatus can be of any kind

(Concluded on Opposite Page)

Those Who

INVESTIGATE

. . . SPECIFY CORKBOARD

YOU'VE probably read that Cudahy Brothers Packing Company of Cudahy, Wis., specified Armstrong's Corkboard for its new freezer room. Similar news comes from Michigan's cherry growers, from the fruit juice organizations of California, from refrigerator car manufacturers—from every other source where refrigeration is required. "Corkboard insulation," they insist.

Nature's Insulation

And scientists and engineers agree. They'll tell you that cork is a mass of minutely divided motionless air particles, forming an efficient barrier to the transmission of heat. Each tiny air cell is permanently sealed. This characteristic of "nature's own insulation" explains the low thermal conductivity of corkboard.

So it's easy to understand why Armstrong's Corkboard today protects quick-freeze temperatures in freezing rooms, cold storage buildings, refrigerator cars, refrigerated trucks, and commercial display cases. Because it resists moisture, because it won't shrink, warp, or buckle, because it won't mold or decay, corkboard is the specified insulation.

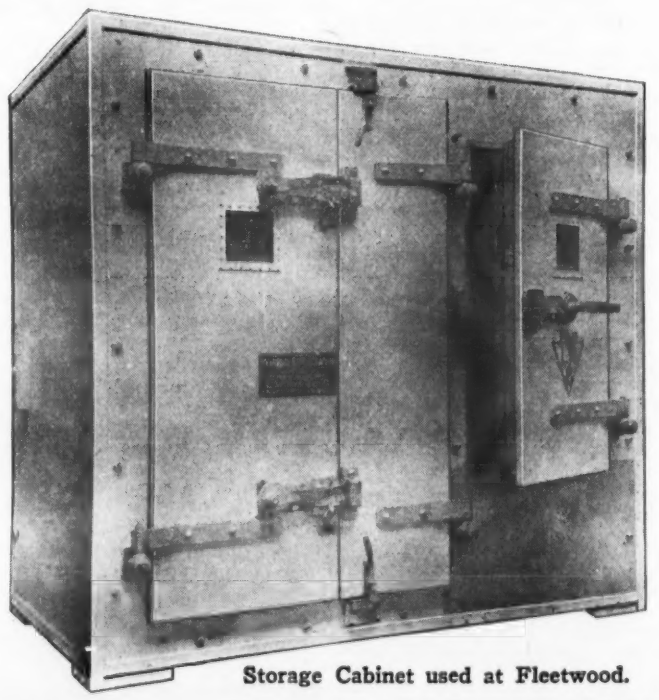
Write for information

These are facts; for Armstrong's Corkboard has successfully met every refrigeration condition for more than a quarter of a century. We'd be pleased to place our facilities at your disposal. And if you are interested in the new quick-freeze process—just outline your insulation problem to the Frozen Foods Development Committee, Armstrong Cork & Insulation Company, 917 Concord St., Lancaster, Pennsylvania.

Armstrong's (A) *Product*

Armstrong's Corkboard Insulation

The Standard Insulation for All Refrigeration



Storage Cabinet used at Fleetwood.

Commercial Refrigerator Equipment

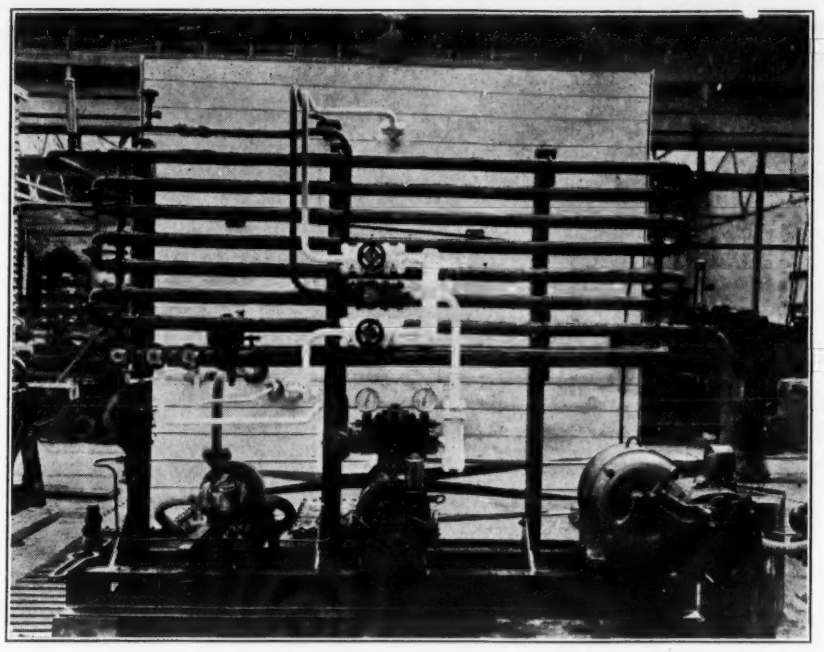
For All Purposes

STOCK or SPECIAL BUILT

BANTA REFRIGERATOR COMPANY

CLEARFIELD, PENNSYLVANIA

Z Quick Freezing Process



Zarotschenzeff Demonstration Plant.

(Concluded from Opposite Page)

and may embody simple cabinets, conveyors, tunnels, belts, overhead conveyors, shelves, trucks. Opportunity for complete mechanization is very great.

5. Ice crystals which are formed in frozen product during the freezing process are usually very large. This explains the damage to the products, coarseness of the frozen product, shrinkage, leakage, dryness, loss of the valuable elements. When, however, freezing is done in a *very short period of time, crystals are very small. There is no damage to the meat cells.*

Meat frozen rapidly, whether by the "Z" Process or by any other equally rapid method, retains all the qualities of fresh product. Juices, flavor, taste, full weight, vitamins are retained in rapidly frozen products. Thus explains the great success of rapid-frozen products and the great value of rapid-freezing methods.

6. There is usually shrinkage of 2 to 5 per cent and more if meats are frozen by ordinary methods. Two to five per cent are saved if frozen by the "Z" Process. This item alone pays for the installation in a very short time, especially when freezing costly products, like chops, steaks, etc.

7. Packaged frozen products offer a new outlet for old products.

8. Present rapid-freezing methods try to employ very low temperatures. Minus 50 degrees F., as usually used, is very expensive. Two stage compressors are required. The "Z" Process requires only single stage compressor, higher temperatures (though can also be operated on minus 50 degrees), hence much lower cost, and freezes equally good, even better.

VISITORS

(Concluded from Page 1, Column 4)

freezing was arranged. Beef steaks, pork and veal chops, brains, kidneys, liver, and fish fillets were put at 60 degrees F. into the "Z" quick-freezer. Some whole fish also were put into the same quick-freezer. After 20 minutes fish were taken out and found hard to the bone. Cutting through the center, through the thickest part, proved the quick effect and the smoothness of quick-frozen fish.

After some 40 minutes all products in cartons were hard frozen and then were subjected to a critical inspection by men who know the meat and fish trade. The natural, unchanged appearance, the brightness of the product, the smoothness of meats in cutting were considered of prime importance. Products quick-frozen by the "Z" method and ordinary frozen meat were compared. The difference was striking. Ordinary air-frozen meat showed rough, broken, dry, dull and unappetizing appearance and was immediately rejected. Some "Z" quick-frozen fillets were defrosted and except for the natural condensation from air on cold product, there was no moisture, no drip or leakage.

After inspecting the machinery and some other products that were frozen by the "Z" method, such as strawberries (kept in storage for six months), chicken (six months in storage), and other side products, the visitors were invited to a special luncheon.

This luncheon was really a test through taste. All products served had been frozen by "Z" method, kept in storage for a considerable time, and brought into kitchen when they were still hard.

The first course consisted of fried and grilled meats and offals. Again the opinions were: excellent, very good, very juicy, no difference from English fresh beef.

Afterwards cooked plums (that had been "Z" quick-frozen) were served.

The whole luncheon was crowned with coffee to which "pieces" of milk had been served. Milk, quick-frozen in cartons by a special "Z" method, kept in storage for 10 and more days, were served on table. "Pieces" of milk were put into coffee, some were defrosted and taken as liquid, some were boiled. In all cases the milk was fresh and could not be differentiated from ordinary milk. No changes could be noticed, either in taste or in appearance, or in general characteristics. As th's had been kept rather secret, the appearance of the "Z" quick-frozen milk created quite a sensation.

Col. Young said, answering a toast by Mr. Zarotschenzeff, originator of the "Z" Process: . . . "We are on the eve of an evolution, or perhaps revolution, in the food trade, where we now witness the appearance of quick-frozen packaged food products with tremendous perspectives in production and distribution . . . the standard of sanitation and cleanliness will be increased manyfold . . . the consumer will receive meat, attractive, sanitary, convenient package with food product which retains all vital elements, like juices, aroma and vitamins. . . "

COPELAND COOLS MILK IN KANSAS CITY DAIRY

Kansas City—The J. R. Rucker Dairy, at 85th Street and Topping Avenue, has recently put in a cooling plant. Nathan Baraban, of the Copeland Refrigeration Co., 1524 Grand, had charge of the work, installing a Copeland XA compressor, which handles 150 gallons of milk daily.

SEEGERS FOR HOSPITAL

Santa Barbara, Calif.—The Cottage Hospital in this city has recently been equipped by the Seeger Refrigeration Co. and the Frigidaire Corporation. In the main kitchen and the separate diet kitchens, refrigeration is playing a prominent role.

The greater portion of the equipment has been centered in the main kitchen. Here Seeger has installed two PH-48-40 refrigerators and one PH-75-62 refrigerator. A special fish box, with front and ends of porcelain, top of Monel metal, is used for storing seafoods. Its interior is Monel metal lined.

Special service counters are neatly arranged in the kitchen. Six counters permit double service and speed up the handling of food. A touch of color makes the counters stand out well in the layout. Exterior front and rear are finished in a special green porcelain, with chrome-plated trim and hardware.

Seven separate compartments in the special service and storage refrigerator are for short orders, cheese, desserts, butter, eggs, milk and bakery products. This twenty-foot cabinet is finished in white porcelain, with chrome-plated trim and hardware. Interior provision compartment walls and ceilings are porcelain lined.

The special vegetable and meat refrigerator has two separate compartments, one for meats and the other for vegetables. Coils located overhead in each compartment permit different temperatures for the meats and vegetables.

The kitchen with all of its refrigeration equipment impresses upon visitors the fact that all perishables are kept in the best possible condition. The stalwart refrigerators look like sentinels on duty. All of the equipment is so arranged that least possible time is lost in obtaining products stored in the refrigerators.

In the many diet kitchens Seeger refrigerators are in use. Refrigeration for all the Seeger equipment in the hospital is furnished by Frigidaire compressors supplied by the Frigidaire Sales Corporation of Los Angeles. The unit type of system was selected so that varied temperatures could be maintained in the many refrigerators and counters. John Given, branch manager at Los Angeles, made this large sale for Seeger.

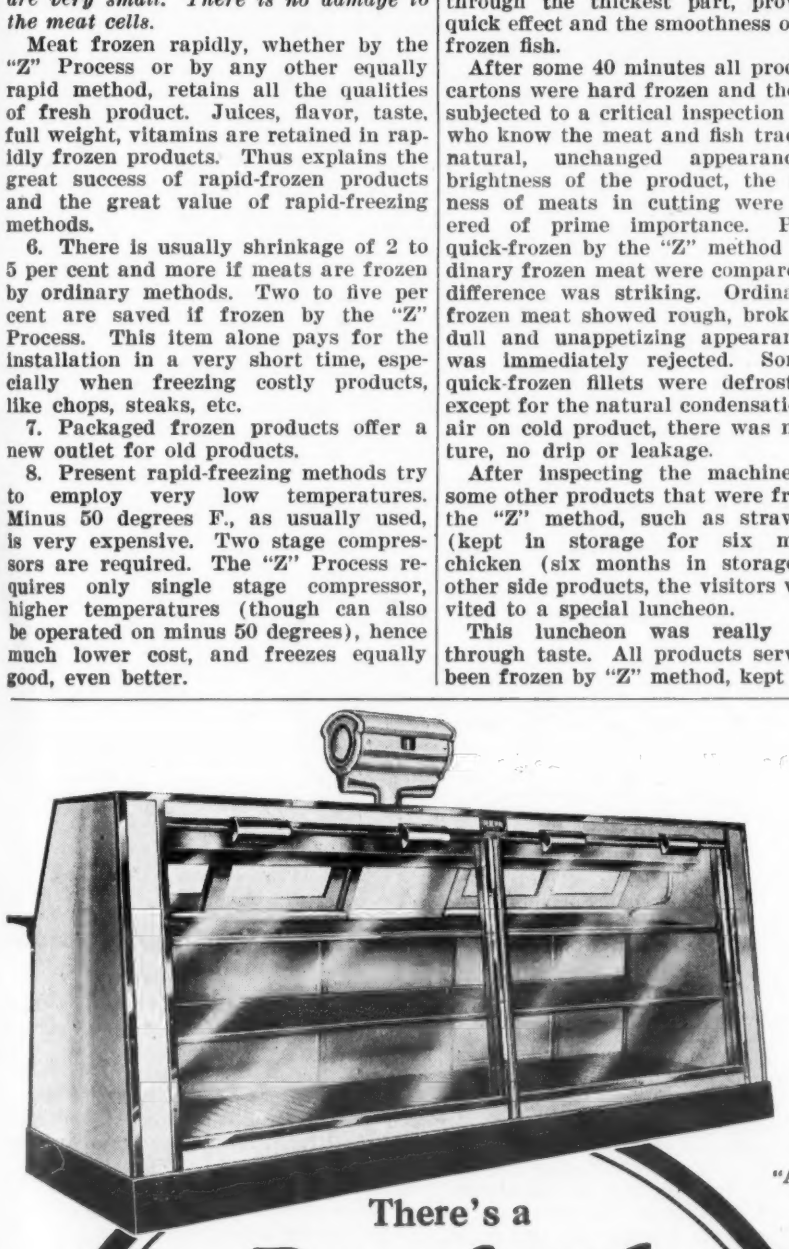
LARGE CROWDS INSPECT MODEL DAIRY FARM

Mundelein, Ill.—A model farm, fully equipped with labor-saving and profit-producing electrical equipment, has been set up by the Public Service Company of Northern Illinois, in Lake County, near Mundelein. Among this equipment is electric refrigeration, both for the farm home and the dairy.

Frigidaire milk-cooling equipment, and a Frigidaire in the farm kitchen are used at this exhibit. Frigidaire coils are installed in the milk-cooling tank, and Frigidaire-cooled water also cools the aerator.

Since opening day on this farm, more than 112,440 people have inspected it, including visitors from all of the forty-eight states and many foreign countries.

Importance of this rural market to electric refrigeration is seen in the fact that the Public Service Company of Northern Illinois has more than 6,000 farmers on its lines, many of whom have electric refrigerators. One mid-western power company reports that 10 per cent of its rural users have installed electric refrigeration.



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No. 800—All Freezer—Combination Display and Storage. All one temperature at or below 20 degrees.

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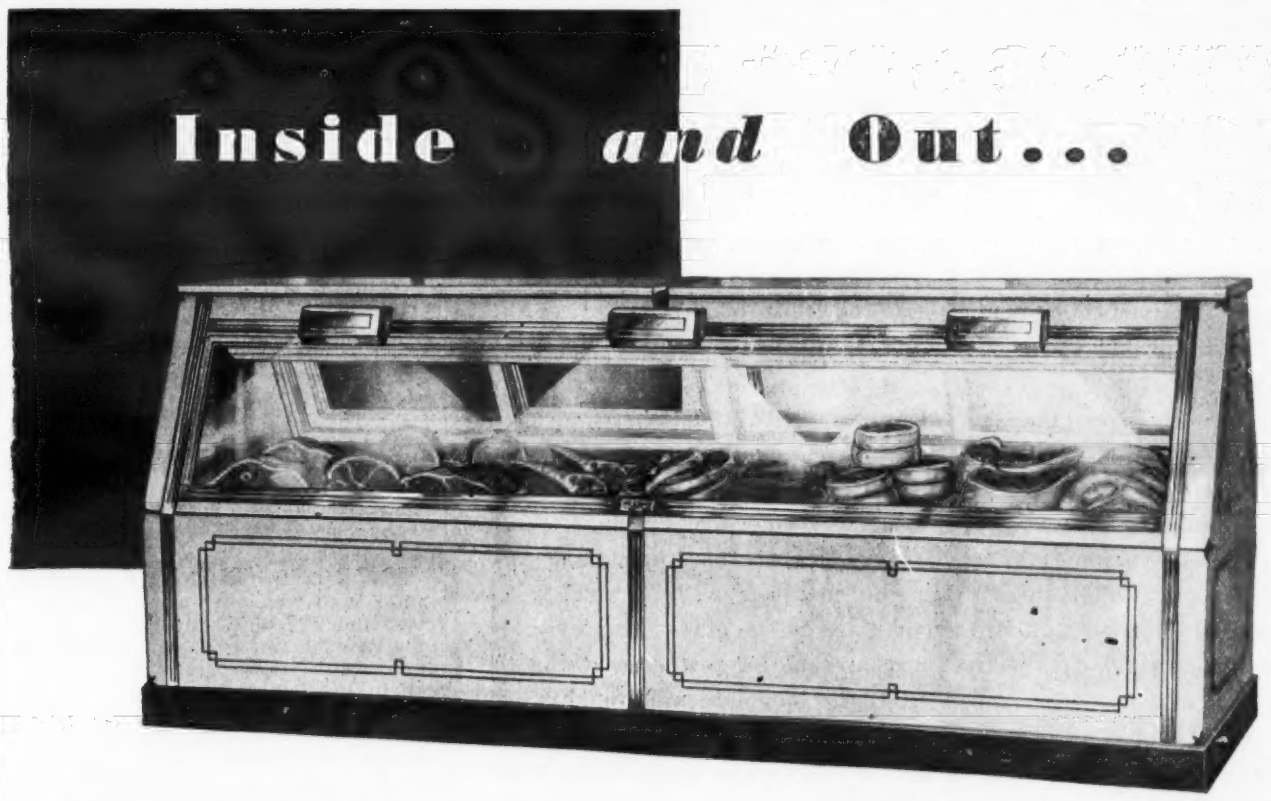

In addition to having exterior Monel Metal trim, the inside ends and back of this low temperature display case are also covered with Monel Metal. Counter mfd. by McCRAY REFRIGERATOR SALES CORP., Kendallville, Ill.

this new McCray display counter shines with attractive Monel Metal

NICKEL ALLOYS
LOOK BETTER LONGER

ON account of its gleaming attractiveness and ready cleanability, more and more Monel Metal is being used for interior as well as exterior construction of refrigerated display equipment. McCray, as well as other leading manufacturers, is now equipping models with Monel Metal inside ends and back, as well as trim.

Users know that it is extremely easy and economical to keep Monel Metal display units clean and inviting looking. This silvery Nickel alloy is both rust-proof and highly resistant to the corrosive action of food juices, refrigerating agents and cleaning compounds. Users also appreciate the value of Monel Metal's lasting attractiveness in winning and holding the good will of customers.

Monel Metal owes its rare combination of desirable properties to the fact that it is a Nickel-copper alloy containing two-thirds Nickel. Monel Metal's silvery beauty, great corrosion-resistance and steel-like strength are largely due to its high Nickel content.

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REFRIGERATED FOOD SECTION

ELECTRIC REFRIGERATION NEWS

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Display?

WHETHER or not display is necessary for the marketing of packaged products, particularly quick-frozen products, is a question that seems destined to agitate those engaged in the marketing of such foodstuffs for some time to come. Everyone admits that display is desirable, but whether or not it is so desirable that it must be had at almost any cost, is another matter.

So far as the refrigeration industry is concerned, this insistence on display makes a hard job of what might well be an easy one. A low temperature storage box doesn't cost much, but a low temperature case which provides display as well as storage requires a type of construction that is always fairly expensive. And not only does it cost more to build with its three or four panes of glass and its intricate lighting arrangements, to mention only two of its more conspicuous features, but it is harder to keep running properly.

In view of the interest in this question, it might be a good idea to look at the idea of a layman so far as refrigeration is concerned, a man who may be said to look at the matter in an impartial manner.

Most refrigeration men read the article entitled "Manufacturing Cold" written by Floyd W. Parsons, in a recent issue of the Saturday Evening Post. It was an article which gave the refrigeration industry a richly deserved place in the public notice. When he came to discuss the display problem in connection with quick-frozen foods Mr. Parsons had this to say:

> "In the merchandising of frozen foods, the present idea appears to be that the refrigerated cases should be similar to the present type of show case that permits the customer to see what he is buying. But the thermal engineer knows very well how difficult is such a plan. With near-zero temperatures inside the case, there is small likelihood that the customer will be able to see through the frost that will accumulate on the glass. Furthermore, why should any prospective purchaser be interested in seeing the outside of a frozen package? He is no longer picking out his own steak or chops; an expert has already done that for him."

Certain refrigeration men will be inclined to scoff at Mr. Parsons for his calm assurance that "there is small likelihood that the customer will be able to see through the frost that will accumulate on the glass," but others who are struggling to rid their cases of that particular disability will not be so sure that he isn't on the right track. The strongest point he makes is that the purchaser is no longer picking out his own meats, but relying on the judgment of the expert in the packing plant.

And, after all, one of the chief arguments for buying packaged and branded foods is the reliance which may be placed on the producer's good name. The average man buys hosts of nationally advertised articles without looking beyond the label on the package when it is handed to him. He doesn't squeeze out a little tooth paste before accepting the tube, and he doesn't tear open the package and count the individual pieces when he buys block sugar. Then why should he insist on actually seeing the packaged roast on full display?

The advocates of display will answer that question with the statement that the modern public is eye-minded; that a brilliant display of fine looking packaged goods will attract customers who will neglect other and possibly better products. They will point to the modern show window, to the wealth of color that is spread before the eye today on every shopping street, and will declare that in order to keep their place in the procession, packaged quick-frozen meats, fruits and vegetables must be adequately displayed.

On questions such as these, the Refrigerated Food section does not need to take sides. It can do its part by pointing out the arguments put forward from time to time on both sides of the question, and by keeping closely in touch with the field so that when the pendulum does swing percepibly one way or the other, it can apprise its readers of that fact. At present the pendulum seems to be swinging toward display, but the question is still an open one and the columns of the Refrigerated Food section also are open to expressions of opinion on either side.

Hill and Frigidaire

Philadelphia, Pa.—When the doors of the Commercial Museum opened recently for the food show conducted by the Pennsylvania Retail Meat Dealers, one of the companies on hand with a large display was C. V. Hill & Co., Inc. The Philadelphia Hill office set up a large attractive display in a booth that had 150 feet of frontage. Here a number of Hill cases of various styles were strategically placed so as to attract the utmost attention. During the two-week period more than 500,000 visitors patronized the show. Frigidaire was also on hand, and with Hill, co-operated in keeping the products on display in cases in good condition. The products in the cool cases looked very attractive.

SNYDER'S TESTIMONY AT WASHINGTON HEARING

(Concluded from Page 1, Column 5)

chief difference between that process and the other processes being that it was a double-contact machine, which is four times as fast in freezing as would be a single contact machine, using the same temperature.

As a result of that investigation, this committee, representing a considerable number of the Western packers and officially representing the Institute and 200-odd packers, made a report that as a result of their tests upon goods which they had themselves selected for the purpose of being processed, they could find no change in the color or flavor or texture or firmness following defreezing, or in any other characteristic except the meats were made tenderer by the process. They did not attempt to state the reason, but they stated the conclusion. Since that time I think it has been quite generally agreed that the effect which is recognized is due to the stretching of the multitudinous cell walls of the flesh structure, whether it is fish or poultry or meat.

Q. You mean the factor of tenderness?

A. The factor of tenderness relates back to the 8 per cent factor of the stretching which comes from the microscopic crystal. The microscopic crystal does not rupture the cell walls, and there is no collapse of tissues and no loss of firmness.

That describes in principle this new factor with which we are compelled to deal, and which, I believe—and in the opinion of many competent people; in fact, most of the competent people who are in the industry with which I am familiar, will make a very great change, in fact, a revolutionary change, in the distribution of fresh foods of all characters and types.

Q. A few moments ago you said that this committee of the American Institute looked carefully into the matter and came away with the conclusions that you have described as to what is known as the Birdseye Process. Where does it get the name "Birdseye"; where does the term "Birdseye Process" come from?

A. The inventor is Clarence Birdseye, an Amherst College man. He went to Labrador on business of his own connected with trading there along the general lines of the Hudson Bay Company; and while there he made the observations which resulted in his devoting his life work to this process. After some ten years it has come to this fruition.

Q. Do you call this a quick freezing process?

A. Yes; they use that term to describe any process which is intended to be limited to the development of the microscopic ice crystal.

Q. Mr. Snyder, what change will the merchandising or marketing of meats that are subjected to such processes as you have just described mean from what has been the method of marketing the meat?

A. I think no man is able to forecast that. You can form a judgment about it. My opinion is that it will open not merely thousands but tens of thousands of new outlets for meat.

Q. Will the meat be shipped from central places in bulk as heretofore, or will the application of this process bring about sale by packaging; and, if so, how?

A. It will entirely change the system of packing house operations. Instead of shipping the dressed carcass of meat to a point as, for example, Boston, where it is consigned to branch houses without sale, the system will be altered so that the process of slaughtering will be merged into the process of packaging in identifiable packages with precise grading following Government standards, leaving at the packing houses the residual, much of which is wasted or turned into an inferior product by being shipped out in the form of fat and bone, which is afterwards taken by the retail dealer from the carcass before he makes his delivery into the form of steaks and roasts, and then it is sold to grease collectors and bone collectors and people of that sort.

This distribution, I think, will go first to the individual grocer, who has been chafing under his inability to go into the meat business in order to protect his business, and follow to that extent the chief chain stores that have gone into the meat business and who have set up a very elaborate organization to develop it successfully, which cannot be followed by the retail grocer, who does not know the differences in grade or cuts of meat. The grocer who has spent his life in the grocery business would be obliged to hire a man who knew it, and would be obliged to depend upon the wholesaler to give him a given grade, or upon his meat cutter, because he would not be a competent judge of grades himself.

Q. This package of quick-frozen meat comes to the grocer so fixed up today that it may be sold by him to the customer without doing any butchering on it?

A. In exactly the same comparative form as his rolled oats, or anything else that he sells.

Q. So that the grocer, without knowing anything about the butchering business, would simply reach into a container and sell a sirloin steak or a lamb chop precisely the same as he would sell a can of condensed milk?

A. Exactly so.

Q. Do they put it in packages so as to protect and keep that low temperature?

A. After it is taken out of the processing machine, it is packed in corrugated cardboard containers containing five or more thicknesses of cell walls, so that the insulation is successful and it may be sent with great success 500 to a thousand miles under ordinary weather conditions, but it can be sent in cars varying from the salt ice car up to the silica-jell car across the continent without difficulty. The distribution is to be effected for freezer display in storage cases.

Q. That is, in the retailer's hands?

A. In the retailer's hands. About all the manufacturers of refrigerators in the country are working on the problem of developing the right kind of insulated freezer and display cases so they can be put in meat and grocery stores. Then the goods are sent to the grocery store in an insulated container. They are put into the display section and into sale without any diminution in weight or quality or condition. Of course, the grocery business is operated upon a very much lower cost basis than the customer retail market, and it will reverse the cost of doing the retailing of meats to substantially that of the grocery business. The only difference would be the additional cost of the maintenance and the electricity with which to operate the self-contained storage unit. A store will either be required to have one without any water-cooling device, or at most a water supply to make the cooling of the liquid, if ammonia is used, or some of the other refrigerating mediums. But with those two that is the maximum required to set up a meat store; to purchase a meat case that will hold 200 pounds or whatever the purchaser desires. That is the impending change in the continuing development of the chain store.

Q. I have been thus far confining my questions to meats. You said in an earlier answer that this quick freezing of food as a preserving process is applicable to fresh fruits and vegetables?

A. To a very considerable list, fresh fruits and vegetables and fish, and so forth. For example, asparagus, green peas, put up by this process and put into a food case three months afterwards, are indistinguishable from those taken from the car. No one could tell the difference.

Q. Then, it is possible with this process to have fresh fruit, or fresh vegetables, what I might call out of season, instead of getting canned fruits and vegetables as the housekeeper does now? Is that true?

A. It is true.

Q. How long will quick-frozen meat keep in the display cases or display refrigerators that you have referred to in the retail stores?

A. As a practical matter, it should be sold inside of one year. Probably it could be kept longer.

Q. What have you to say with regard to the period of time that vegetables that are susceptible to this process and fruits that are susceptible to this process, can be kept?

A. The same thing would be true of those items.

Q. Is the quick-freezing process being used now?

A. Yes. It has been limited by the people who control the patent—the General Food Corporation—because they are waiting merely for the development of protected forms of storage and display cases, which will operate at zero temperature in the hottest weather.

Q. Does the General Food Corporation control the Birdseye Process?

A. Yes.

Q. What did they pay for it?

A. With some assets, they paid $22,000,000 in cash for it.

Q. When did they acquire it?

A. A little more than a year ago.

The Court: What did the inventor get out of it?

The Witness: About a million dollars.

By Mr. Hogan:

Q. Mr. Snyder, to what extent has this process been used in the processing and selling of foods?

A. We have a plant installed in our place, of moderate capacity, and have been using that as the next step beyond an experimental laboratory; that is, it is a commercial plant of small size; and we have been placing these goods for several months in a limited list of stores in Springfield, Massachusetts, where we are making now about 3,000 sales per week.

Q. Of package goods?

A. Of package goods. Those stores were selected with great care and they furnish a cross-section of all the stores found in New England; that is, a very small grocery store which never sold meats; a larger one, which never sold meats—six of the latter being selected; and then we went into a large meat store and put goods in competition with medium-grade meats; then in another store, where they sold very choice meats, and so on to get the experience and the reaction of the public. That experiment is still going forward.

Q. You have told the Court that this process is as applicable to fish as to meats. Is that right?

A. To all perishable foods that are sufficiently valuable to make it worth while to put them through the process.

Q. As a matter of fact, is it within your knowledge that fish caught in the Atlantic and on the Atlantic Seaboard now, by the use of this process are served fresh all over the country?

A. In my opinion, the fish which are

(Concluded on Page 8, Column 1)

HOMEMAKING

In Midst of Amazing New Development

By Nancy Carey

CURIOUSLY enough the interest in homemaking a few years back seemed not to have kept pace with the advancement of the era, and this may be attributed to one or two causes—the fact that women as a whole had accustomed themselves to the ways of their grandmothers and to homemaking predicated upon such equipment and methods as grandmother knew, and to the fact that women felt no need to advance with the times in what they considered a necessary but homely occupation.

At the present time, however, equipment for efficiency in the home has developed to such a point that a new and rather amazing interest in the art of homemaking has sprung up, and this interest plays a close second to the present interest of businessmen in making their business so efficient as to expend not one atom of energy, time or money which can be avoided.

In proportion to this new interest among homemakers in household matters, many monthly periodicals have developed departments which offer assistance to any woman who is interested in further developing her knowledge of expert and efficient homemaking. It will be unnecessary to name the particular periodicals of which I speak, for they are widely and well known.

But because of the particular and recent development of my homemaking institute at the *Public Ledger*, I should like to explain the method of its operation.

We started, a brief three years ago, a small department known as the Homemaking Department, on the seventh floor of the Ledger Building in one room in which the six persons who soon found themselves there overcrowding the space to the point of overflowing. We offered a service which would answer any question to any reader interested in homemaking. Letters began to pour in and it was necessary to increase the staff constantly. Space was added to the extent of two rooms, one of them nearly twice the size of the one we originally occupied, and the Nancy Carey homemaking column was syndicated.

It is safe to say that our mail return in the beginning was approximately 25 letters a day for the first few months. This mail return increased at such a rate that at the present time our average over the entire three years is 60,000 letters per annum, and each one of these communications receives a personal reply.

To be sure, the syndicate is still another story, but it is interesting to know that our homemaking column has a daily circulation of approximately 2,000,000.

Now then, just what is it we do—the list is rather a long one.

We budget the incomes of our homemaker readers and check these budgets every month, keeping them in working order.

We assist with decorations of the home that they may be in good taste.

We plan balanced meals for from, let us say, one to five hundred in number, these latter, of course, pertaining to church functions, civic gatherings, etc., upon the committees of which some of our readers serve.

We maintain a weight control department which will assist a reader either to lose or gain weight, as the case may be, and to lose or gain it so slowly as not to affect the health, but to build a definite and steady loss or increase.

And last but not least, we demonstrate recipes which are of material interest to homemakers, to groups of women twice each week in the new model kitchen which was added to our department recently. These functions are called "tea parties" and our guests are served the dishes prepared at the meetings.

We test equipment of all sorts—electric refrigerators, electric stoves, vacuum cleaners, sinks, washing machines, kitchen cabinets, floor waxing machines, hot water heaters; in fact, all equipment offered for use in the home can be placed on test in our Institute and a report of its efficiency, cost of maintenance, etc., is placed in our files.

In our work with women it has been easy to see that the interest in homemaking of which I speak has reached an amazing peak, but not necessarily its ultimate peak. Women are willing to buy equipment, in fact, eager to possess themselves of equipment to aid them in their homemaking, even though the equipment may, for the time being, require of them a sacrifice in their other expenditures. They are curious and eager to know just what the various pieces of equipment for the home will do to assist them in their labors. Their questions are intelligent. They inquire as to expense of operation, durability, and the life of equipment which they contemplate purchasing. In addition to this, they inquire concerning the proper balancing of menus, proper baking methods and proper canning methods.

As one watches a child grow and develop into the thinking, reasoning human being that it later becomes, so in work of the kind I am doing, do we watch the women emancipate themselves from the old methods of grandmother's time to the efficient, modern housewife who at the present time wishes to spend as few hours as possible each day in her kitchen, that she may have time for recreation, reading, exercise and other matters pertaining more to the world at large.

It is unnecessary to say that this work is a satisfaction and pleasure to all of us who are concerned with it.

A Recognized Expert

IN and around Philadelphia the name of Nancy Carey is familiar to more than 1,000,000 housewives. She is director of the Homemaking Institute of Philadelphia Public Ledger, which conducts the Public Ledger Institute to which women flock daily in order to hear Miss Carey speak. Miss Carey has written for the Refrigerated Food section this brief account of the work that she and the Public Institute are doing; work in which refrigeration, and particularly the domestic electric refrigerator, play a prominent part.

STORES AND RESTAURANTS BUY LIPMANS

Kansas City, Mo.—The General Refrigeration Co., here, has just finished a number of commercial installations. In Valentines' at Westport and Main, a model 310 Lipman machine cools three open salad pans, one beverage cooler, one drinking water cooler, two slide top storage boxes and two grocer refrigerators. The machine, located in the basement is connected with the cooling units by 365 feet of cork-covered line.

The two new M. System stores at 39th and Warwick, and 63rd and Oak, each use a model 151 Lipman machine to cool a 10-foot display case, a grocer refrigerator and a walk-in cooler.

L. H. Hays, 1901 N. 13th St., has had a 7-foot Viking display counter, meat cooler and counter, with model 75 Lipman machine installed.

Two Koch display cases, a 12-foot and an 8-foot, and a model 81 Lipman machine have been placed in the Post Exchange at Ft. Leavenworth, Kansas. The New Manhattan Cafe at Salina, Kan., has a kitchen box and a storage refrigerator cooled by a Lipman.

REFRIGERATION CRASHES YALE CAMPUS

New Haven, Conn.—Modern Home Utilities, Inc., 1102 Chapel Street, General Electric refrigerator dealer, has completed an installation of 10 units in the Institute of Human Relations building at Yale University. The units are for use in bacteria and culture work and in the diet kitchen in the Yale Medical School and the new clinic building of the university health department. The units consist of four C. S. 270's, four G. 40's and two G. 55's. A D. P. water cooler was also installed in the new clinic building, according to Miss Ann Johnstone, assistant manager.

TELEPHONE BUILDING IS FILTRINE EQUIPPED

Hempstead, N. Y.—The local Filtrine distributor reports the installation of Filtrine water coolers to supply entire office of the New York Telephone Company in its new building just completed in this city.

Filtrine Model 1-A coolers and Servel water-cooled machines were used, supplying chilled water on each floor as well as for the cafeteria.

Each cooler was equipped with side stream bubbler and, in addition, supplied chilled water to bubblers located on floors above and below. Five coolers were used.

REFRIGERATORS FOR HOTEL GUESTS

Oakland, Calif.—One of the innovations at the new Lake Merritt Hotel, the first unit of which was officially dedicated on November 1st with a dinner to East Bay social and civic leaders, is the provision of servettes and salonettes for guest rooms. The servettes have Frigidaires, allowing service to the individual rooms from the main kitchen without disturbing the guests.

BESSEMER HOSPITAL EQUIPPED

Birmingham, Ala. — Installation of three General Electric refrigerators and two water coolers in the Bessemer Hospital at Bessemer was completed recently by the Birmingham Electric Co., dealers in Birmingham and Bessemer. The sale was closed by Joe Crowder.

The cultivation of what is known as the "institutional field" is providing not only good prospects but a considerable number of sales in this section. The sales usually are fairly big ones, too.

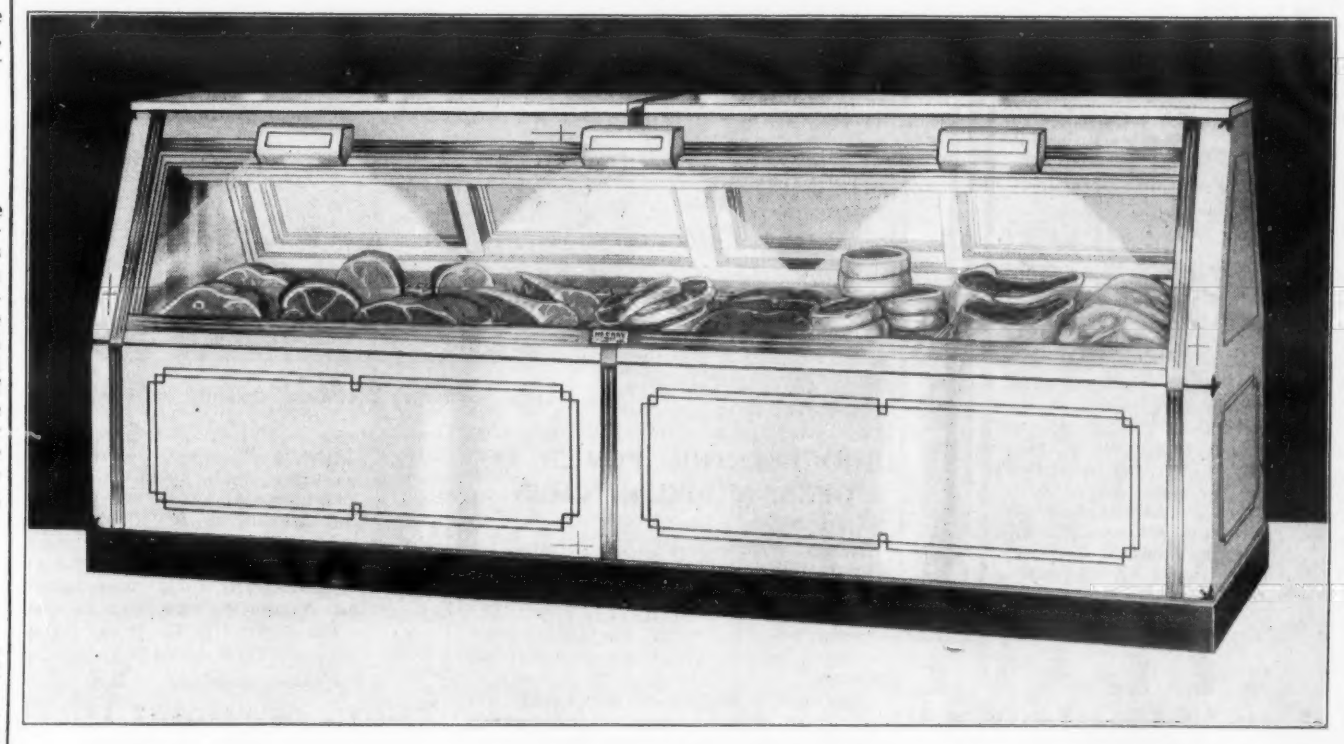
Kroger's Complete Food Market

Cincinnati, Ohio — Kroger's complete food market here, which recently opened, has attracted considerable attention because it enables housewives to purchase all their food supplies under one roof. Refreshments obtainable at the large soda fountain in the store are also appealing to the Cincinnati housewives.

The installation of display cases, counters, coolers, etc., was made by the C. Schmidt Company, of Cincinnati. Schmidt engineers co-operated with Kroger officials in designing the layout of the large store. Refrigeration for the various pieces of equipment is supplied by three various makes of machines. A Lipman machine cools the refrigerated display window, while a York unit handles the storage refrigerator and counters. Frigidaire is on duty at the soda fountain and back bar.

For LOW Temperatures
The McCray Model No. P-110

Designed especially to display the new quick-frozen packaged foods, the McCray Model No. P-110, for machine refrigeration only, is built to maintain required low temperatures and to enable the food merchant to operate most efficiently in this new development of the industry. . . . .



The McCray No. P-110, thoroughly insulated with 4 inches pure corkboard sealed with hydrolene, embodies the same standard of quality and staunch in-built construction which has marked the name McCray for 40 years. This is of utmost importance to every dealer in mechanical refrigeration as it insures efficient, economical operation—the most satisfactory service with any type machine. • The McCray line is complete—there are models for every commercial need. Dealers in machine refrigeration are invited to write for information and descriptive literature. No obligation. • McCRAY REFRIGERATOR SALES CORPORATION, Department 66, Kendallville, Ind. Salesrooms in All Principal Cities. See Telephone Directory.

ALL McCRAY MODELS MAY BE USED WITH MECHANICAL REFRIGERATION OF ANY TYPE

McCRAY Refrigerators

WORLD'S LARGEST MANUFACTURER OF REFRIGERATORS FOR ALL PURPOSES

REFRIGERATING

Unit for Truck Bodies Powered by Gasoline Motor

REFRIGERATOR truck bodies are being manufactured by Robbins & Burke, Inc., Cambridge, Mass. Mechanical, Dry-Ice, cartridge or ice and salt systems of refrigeration can be used in R. & B. truck bodies.

R. & B. mechanical bodies are refrigerated by a refrigerating unit which obtains its power from a gasoline power plant. This plant has an attached generator which delivers the power direct to the refrigerating unit.

This system is automatic through a Mercoid control which is connected to the power plant. When the temperature of the cooled compartment rises, the Mercoid control will throw over and start the power plant, which in turn starts the refrigerating unit. The power plant is equipped with a starting battery which is kept constantly charged by the generator.

The refrigerating system is direct expansion, using a ½-inch seamless, galvanized iron coil. This coil is located on the top and both ends of the refrigerated compartment. Flanges are bolted as in ammonia systems. The refrigerating unit is reciprocating type and is air-cooled.

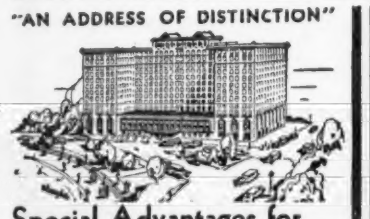
Cartridge refrigerator bodies are cooled by cartridges which have been previously frozen in the hardening room. In the Dry-Ice refrigerated bodies, the Thermo-Siphon system of gas circulation around the entire refrigerated compartment is used.

Allied products made by Robbins & Burke are Dry-Ice shipping containers, Dry-Ice storage boxes, peddling boxes, refrigerated push carts, refrigerated side car bodies, storage rooms and cabinets, and mechanical ice cream cabinets.

SCHUSTER DELICATESSENS SERVEL EQUIPPED

Milwaukee, Wis.—The Ed. Schuster Co., with three large department stores in different parts of the city, has just installed new delicatessen departments, equipped with Servel refrigeration. The Upper Third Street store, with nine cases, is the largest, followed by Twelfth Street with six, and the South Side with five.

"AN ADDRESS OF DISTINCTION"



Special Advantages for "Big Game" Visitors

FANS visiting Chicago for the big football games will find THE DRAKE location unusually convenient. All playing fields are easily reached. After the game . . . there's gaiety . . . or quiet . . . as you prefer. A smart Supper Dance . . . the rhythmic tunes of a famed Orchestra. *No rate advance. Rooms begin at $5 per day.*

THE DRAKE HOTEL, CHICAGO
Under Blackstone Management

Educating the Housewife

Kansas City, Mo.—The first Lamb School, conducted under the auspices of the National Wool Growers' Association, was held here every morning, Saturdays and Sundays excepted, from 10 to 12:30 from October 13 to 25, inclusive.

The place of meeting was the Plaza Theatre, where the lobby display attracted attention and the stage was occupied by demonstrations of lamb cutting and cooking. Admission was by ticket only but any interested woman could obtain a ticket from her butcher, grocer, or at the door.

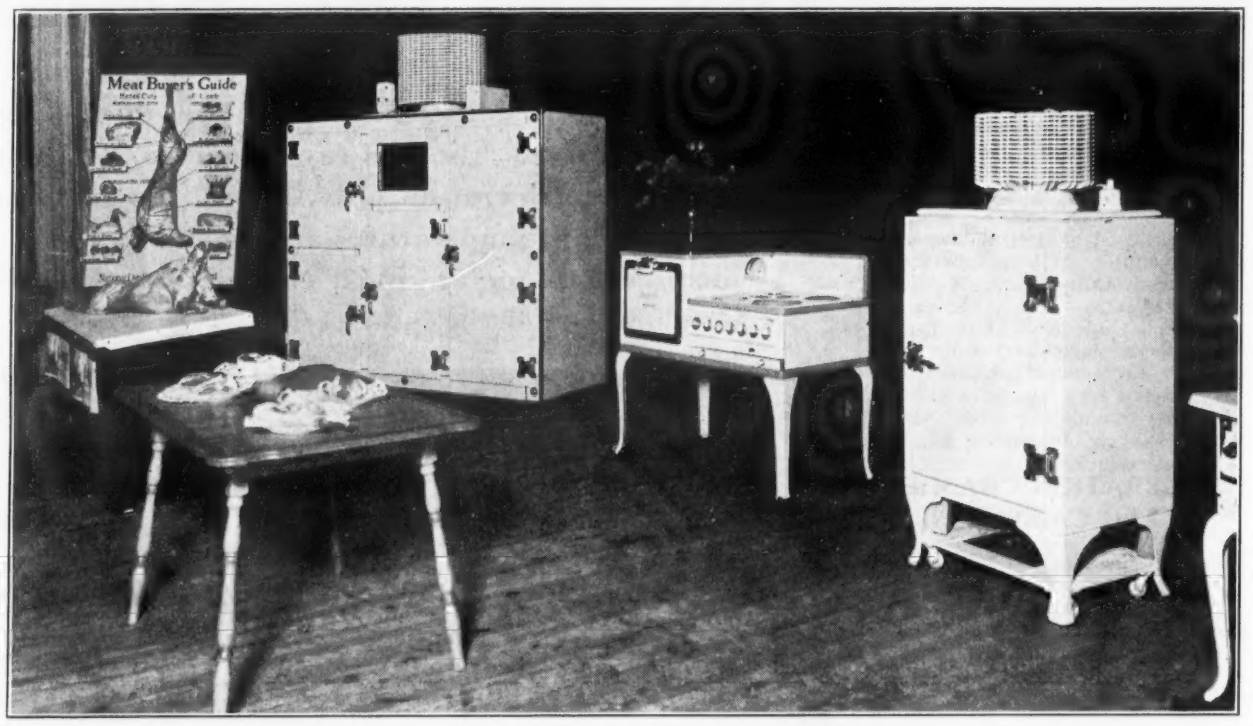
The stubs of the tickets were numbered and some of them drew prizes. Twelve to fifteen cuts of lamb were given away daily, and a Hot Point range and General Electric S-42 refrigerator were given at the end of the school. There was a daily attendance average of 500.

Glueck & Company, distributors of General Electrics for this territory, cooperated in every way with the National Wool Growers' Association in their efforts to encourage the consumption of lamb. They furnished the refrigerator given as a prize, as well as those used in the meat demonstration.

Max O. Cullen, meat demonstrator, and Miss Nora Altic, home service demonstrator, both of Chicago, conducted the school. The raw cuts of lamb were kept in a G. E. 451, while Miss Altic used an S-62.

This school is the first of a series planned to be put on in the middle west to educate the housewife in the use of lamb.

End leg bones of mutton and lamb fresh from the G. E. refrigerator were passed through the crowd that the housewives might learn to judge by the texture the age of the animal; the bone of the lamb showing a smooth surface, while that of a sheep is rough. The two General Electrics used in the demonstration were mounted on trucks to permit them being moved off stage for the regular afternoon and night shows.



The General Electrics on duty at the Lamb School.

OHIO ELECTRIC POWER CO. OPENS MODEL KITCHEN

Sidney, Ohio—For the purpose of stimulating use of electric refrigerators, ranges, food mixers, dish washers, toasters and other electric appliances for kitchen use, the Ohio Electric Power Company has installed a model electric kitchen.

The recent meeting to inaugurate the laboratory was addressed by Miss Edwina Nolan, home service director of the Electric Refrigeration Department, General Electric Company, Cleveland. Photophone films, made by the General Electric refrigeration department, entitled, "The Measuring Stick of Good Health" and "Sealed in Steel," also were shown at the meeting. The session was attended by forty-eight members of the Women's Committee of the Ohio Electric Power Company and the United Public Service Company.

SMITH OF LINDSAY CO. GETS LARGE ORDERS

Milwaukee, Wis.—Two large commercial jobs were recently sold by J. M. Smith, salesman for the Lindsay Automatic Refrigeration Co., Frigidaire distributors. C. D. Dunlop's meat market at 269 Third St., and one of the restaurants operated by the Boston Lunch, were completely equipped.

The equipment refrigerated at Dunlop's consists of a 12 x 14 Federal cooler, a 66-ft. top display case, including an 8-ft. window display for the front of the store. Mr. Smith placed the following equipment: 2 Model "C" 1 h. p. compressors, 1 Model "U" ¾ h. p. compressor, 4 1866F coils for the walk-in cooler, 9-75F, 1-76F coil for the display cases.

In the Boston Lunchroom there is a large walk-in refrigerator consisting of a meat section and a storage section, one service refrigerator, 2 special ice cream cabinets, 1 kitchen refrigerator, 1 bakery refrigerator and 2 water coolers.

The Frigidaire equipment used to refrigerate the above equipment consists of 1 Model "C" compressor, 4 63F coils for the large meat storage compartment, 1 Model "C" compressor for the vegetable storage and service refrigerator with a 1278F coil in the former and a 63F coil in the latter; 1 Model "Y" compressor and 2 20X coils for the special ice cream cabinets; 1 Model "U" compressor with 1 88F coil in the kitchen refrigerator and another in the bakery refrigerator. The water coolers consisted of 1 heavy duty P-150X and 1 P-45X coolers equipped with glass fillers.

MODEL GROCERY IDEA TAKING IN SOUTH

Jacksonville, Fla.—Within two months after the establishment of a model grocery in Jacksonville, Fla., 41 local stores had completed remodeling. It is anticipated by the Jacksonville Retail Grocers' Association that 50 more retail grocery stores will be remodeled in the course of three or four months. A model grocery store similar to the one operated in Jacksonville is reported to be opening in Atlanta, sponsored by local associations.

Courses in grocery retailing are being organized by the local retail grocers' association in coöperation with the National Association of Retail Grocers and the State Vocational Training Department. Every phase of grocery merchandising is to be covered by the 13-week course, which is free to members, but classes are limited to 15. Weekly meetings are planned.

SMALLER REFRIGERATORS OR BIGGER KITCHENS

Louisville, Ky.—E. D. Via, manager of the Electric Refrigeration Co., General Electric distributors, says that one of the greatest problems he encounters in selling refrigerators is to get them in the kitchens. In the present rage for small homes and apartments, architects often do not consider the arrangements that are necessary to accommodate the fittings that the modern housewife needs.

Mr. Via has overcome the lack of space in a number of instances by installing the refrigerator in an archway in the wall, with a grill in front of it, which makes a very attractive way of treating it. In other cases, room is provided by using a collapsible kitchen table.

The Louisville company is doing educational work among the architects of the city with a view to getting them to provide larger kitchens in the new homes.

New ADDISON HOTEL
Featuring Comfort Quality and Service
450 ROOMS of REAL COMFORT
$2.00 A DAY
Special weekly and monthly rates
GARAGE IN CONNECTION
L. McGREGOR Manager

DETROIT
WOODWARD AT CHARLOTTE

TREMENDOUS

Possibilities Inherent in Development of Quick Freezing

AN interesting contribution to the literature on the quick freezing of foods is made in the November 1st issue of *Forbes' Magazine*, by Colby M. Chester, Jr., president of the General Foods Corporation. Mr. Chester speaks with the greatest confidence of the future of the frozen products, and leaves the reader with the impression that the experience of his company in Springfield, Massachusetts, has dispelled all doubt on that subject.

In the early part of the article Mr. Chester reviews much recent history in Springfield and elsewhere that is thoroughly familiar to the readers of the Refrigerated Food Section, who have had an opportunity to follow the Springfield campaign in detail since it began last March. In closing he says:

Cost of Quick Freezing

"The advent of artificial refrigeration brought in its wake the idea of the small container for resale to the consumer. The entire cost of packaging and freezing a product and then placing it in an insulated container is only a few cents per pound. This moderate bulk cost is more than equalized by numerous savings and the finished product can be put into consumer channels at an average price comparable with those now prevailing for similar commodities sold in other forms. With the exception of the actual freezing, the factory packaging and handling takes the place of similar services otherwise performed later, and the doing of these things in the factory permits the labor to be standardized and allows waste to be utilized.

"Human food requirements and preferences have undergone revolutionary changes during the past decade. The old staples face new and vigorous rivals. When, for example, more than $75,000,000 worth of salad dressing is sold in the United States within a single year, it signifies much more than a surprising gain in a heretofore minor product—it manifests significant changes in the nation's food habits.

"Styles in food change just as do those in wearing apparel, automobile bodies, household appliances and furnishings. Our changing food habits and the increased recognition of the essentials of a balanced diet have spelled opportunities for manufacturers and distributors of food products, particularly in package form. With the growth of apartment houses, the former custom of buying food in bulk and storing it in the home has decreased. The modern grocery serves rather as a community pantry, from which the housewife obtains her supplies—for the most part neatly packaged—as needed.

Nation's Food Bill

"The national food bill of the United States is around $23,000,000,000 each year, and the specialty manufacturers are providing a steadily increasing proportion of the total. And now, the rise of packaged frozen perishables promises to add to this steadily rising total.

"The ready acceptance by the public of quick-frozen perishables indicates benefits for other large American industries. Many of the 400,000 grocery stores in the United States are potential users of new electrical refrigeration equipment. The refrigerator companies, both electric and gas, will profit considerably through equipping stores, refrigerator cars for railroads, trucks and airplanes. In the same respect a great deal of cork for insulation, plate glass and metals will be used, thus aiding those trades. A new and vast market has been opened for the manufacturers of waxed papers and containers. The automobile industry will be called upon for special trucking facilities. Railroads, ships and airplanes will be needed to transport frozen food products over long distances. Farmers will be able to sell perishables that are now wasted in vast quantities each year through lack of preservation and refrigeration facilities. Last, but by no means least, the consumer will have the equivalent of fresh perishables, heretofore limited (except to persons of ample income) to brief seasons, throughout the year. So the possibilities inherent in the new development are seen to be truly tremendous.

The Complete Meal Next

"Eventually we expect to offer packages of complete meals containing all the necessary foods for several repasts, at various price ranges, based on quality and quantity. It will then be possible to go into a store, order a $1 meal for three and carry out a complete dinner.

"With the virtual elimination of unsanitary foods, the national menu today is more appetizing and more nourishing than ever before. The American factory worker is better fed than were the kings of the eighteenth century. Ultimately—and the time seems not far away—the consumer will be able to eat whatever tickles his fancy, no matter what the season, or how far removed he chances to be from the sources of supply."

NAUTICAL

Setting for San Francisco Fish Grotto

San Francisco, Cal.—When Maurice Bernstein recently rebuilt the front of his world-famous Fish Grotto in this city, one of the windows was designed

to give the appearance of an ice grotto in which are displayed fish and shell fish. Silver soldered tubing extends from the Frigidaire to the rear of the window, where the tubing has been so arranged to form an ice grotto.

The display in this window is changed daily by an expert window dresser, the temperature being maintained at about 36 degrees. The fish and shell fish are arranged among greens and the entire window is well lighted from the ceiling.

Another interesting feature of this restaurant is a ship's prow that juts out to the sidewalk and forms part of the front of the fish grotto. The ship closely follows in size and detail that of the Nina, the flagship of Christopher Columbus. The ropes of the vessel are outlined in Neon lights in green and red.

Another interesting feature in connection with this unusual establishment is the system of refrigerated "immediate boxes," which are maintained at a temperature of 36 degrees for the fish and 34 degrees for the shell fish by means of a Cyclops machine operated by a 12-h. p. electric motor.

As the fish and shell fish are received they are placed in the "immediate boxes." These boxes were constructed as follows: The outside wall is of metal lath and plaster coated on the inside with emulsified asphalt, then lined with two inches of Armstrong sheet cork, which is in turn coated with asphalt and a second layer of 2-inch sheet cork, with joints broken, also coated on the outside with a thin layer of asphalt, over which is a full coat of emulsified asphalt troweled smooth and painted with alumminum Anchorite paint for waterproofing the inside of the box.

The cooling coils are arranged to form shelves, the shelves extending from a point 24 inches above the floor to the ceiling of the box, being 7 inches apart. The fish are sorted and placed in metal trays as soon as they are received, and the filled trays placed on the shelves. The shell fish are placed in similar trays except that these trays are perforated. The main walk-in fish box is 8 ft. by 11 ft. and 9 ft. high. After the fish are filleted, boned and finned, etc., they are placed in trays on the lower tiers of shelves, ready to be transferred to the compartment box adjoining the range, ready for the chef. There are also vegetable boxes. All refrigerated compartments open off a vestibule, which keeps the boxes at a more even temperature.

OMAHA

Butchers Voice Objections

(Concluded from Page 1, Column 1)

must be paid. The more time and labor expended on preparing an article for market the greater the cost of that article must be in order that the making of it may be continued. Someone is going to pay for the extra labor in preparing 'quick-frozen meats.' Just now the people are not looking for more added cost to the already high overhead, but much prefer to see a reduction in living expenses.

"Now, unless the meat dealers choose to handle this class of meat, who will market it? Service is the one big thing in buying at this time and the housewife insists that delivery be made at the kitchen door. Delicatessens, barber shops, druggists will not do this should it become the rule to carry a stock of quick-frozen meats.

"Three things are now demanded of the meat dealer: economy, service and quality," said Mr. Cameron. "Retail meat dealers of Omaha are now giving all three and have a satisfied clientele, yet there is one thing lacking. The government reports show there is a falling off per capita in the consumption of meats. The thing that will benefit both the packers and the meat retailers must be something that will induce a greater consumption. I have yet to see where the proposed selling of the quick-frozen meats will do this.

"In fact," concluded Mr. Cameron, "I see where, if this plan is followed to its ultimate end, it will result in doing away with the retail meat dealer and place the market entirely in the hands of the packers. There are some cases in the courts right now that bear on that very phase of the question. For years the U. S. Government has frowned on the attempt of the packers to sell all foodstuffs, thus creating a monopoly.

"There is yet the bare possibility the demand for these meats may become so strong that the retail dealers will be forced to sell them, but that seems a very remote possibility. Until then the retail dealers of Omaha choose to stand on safe territory and will not sell nor countenance the sale of quick-frozen meats put up in identifiable packages."

HARD TO TAKE

Great Barrington, Mass.—H. W. Small, Westinghouse dealer for this territory, has become so used to breaking his neck to make quick deliveries of refrigerators for persons who insist on long-time payments, that he nearly swooned when a Sheffield man walked into his store, planked down the full amount for a medium-sized household unit, and asked to have delivery made next April.

The Ice Grotto in the Show Window.

Canning Industry Interested In Quick Freezing Development

By W. E. Vaughn, American Can Company

FROZEN foods might be roughly classified into three general divisions: 1. Fleshy products. 2. vegetables, and 3. fruits. The freezing of fleshy products such as meats has already been admirably discussed and need not be a part of the present paper. From the standpoint of freezing, vegetable canners have not shown a great deal of interest in this method of preservation of vegetables, due possibly to the fact that the advantages of the frozen product are not so evident as compared with the canned product sterilized by heat. The canners of fruit, however, have shown interest in the freezing of fruit for many years, and have renewed interest at the present time in the possibilities of frozen fruit in small containers.

The Research Department of the American Can Company has given frozen fruit special attention since 1927, and I shall, therefore, confine my remarks to the relation of the canning industry to the packing of frozen fruit in small containers for household consumption.

The primary problem of the packer is economical production of suitable fruit preserved by freezing. His secondary problem is distribution.

The canner as a producer of frozen fruit is in an ideal position. His organization has for years grown the fruit, harvested it and prepared it for canning through a multitude of factory operations. No special equipment other than that at present in the canner's plant is necessary for the production of fru ts for freezing, up to the time the fruit is placed in the container. At this point, the product emerges from the regular channel in the handling of commercial heat-treated canned fruit.

THE canning industry is quite naturally keenly interested in quick-freezing developments. At the recent low temperature meeting of the Detroit Section of the A. S. R. E. one of the most informative papers was read by D. F. Sampson, of the American Company. This paper, which was prepared by W. E. Vaughn, who was unable to be present, is reprinted on this page.

Both Mr. Vaughn and Mr. Sampson are members of the corps of experts which the American Can Company maintains at its research laboratories in Maywood, Ill. They have been following quick-freezing progress closely in the last year or two and are well qualified to discuss the phases of the subject covered by this paper. The canning industry expects to play a real part in quick-freezing work.

The freezing of fruit is not a new experience for the canner. The freezing of fruit in large containers such as barrels and 30-lb. tin containers has been practiced by canners for many years. However, the freezing of fruit in small containers for household consumption is a new experience for the canner. Problems are encountered in the packing of frozen fruit in small containers which are not apparent in the packing of frozen fruits in large containers.

Some of the problems of freezing fruits in small containers are the type of container, the type of closure for the container, the prevention of discoloration of the product, the kind and degree of sweetening agent which must be added to the product, and the prevention of mould growth. As regards containers, fibre, glass and tin containers have been used. The closure of the container may be non-hermetic, hermetic or hermetic under vacuum.

Certain fruits, as for instance red sour pitted cherries and peaches, are subject to air discoloration, and we have found in such instances that the packing of these products in tin containers which are hermetically sealed under vacuum is of great value in reducing discoloration. Most fruits when packed with sugar or syrup will develop mould growth due to the presence of moulds in the product if temperature conditions are favorable for growth. Here again we have found that products packed in tin containers hermetically closed under vacuum are less subject to mould growth under similar temperature conditions than the product closed in non-hermetic containers.

Present Day Practise

The use of low temperature refrigeration at the plant of the frozen fruit canner merits considerable attention. At present, specially developed mechanical equipment for the quick-freezing of fruit is not in general use in most of the canners' plants. Most canners subject the containers immediately after packing to temperatures of from 0 degrees F. to 30 degrees below zero by placing the containers in a room maintained at these temperatures. Following freezing the containers may be removed to a room maintained at from 0 degrees F. to 15 degrees F. for storage.

The refrigerating equipment in the canners' plants presents an interesting problem for the refrigeration engineer. It must be remembered that the packing season for fruit is comparatively short and the initial cost of the equipment should, therefore, be kept as low as possible. In many canners' plants the frozen fruit is transferred to cold storage warehouses in the large centers of population immediately after the pack is completed, and the refrigerating equipment at the canners' plant may, therefore, be idle for perhaps 11 months of each year.

In addition, the demands upon the refrigerating equipment in the canners' plant may be tremendous during the packing season. The fruit may be placed in the freezer at all times during the day and night, with the result that at times cold storage rooms which are normally operated at a temperature of about 0 degrees F., may show a temperature of little below freezing. These conditions must be recognized by the designer of refrigeration equipment and facilities made available at the canners' plant so that the fruit is frozen quickly and maintained during storage at a temtemperature of not more than 15 degrees F.

The role of refrigeration in the distribution of frozen fruit is of paramount importance. For the transportation of frozen fruit, low temperature refrigeration as applied to automobile trucks, railway cars, and steamships must safeguard the product from the time that it leaves the canners' factory until it is delivered to the local retailer or to the household consumer.

Facilities as regards low temperature refrigeration are now generally available in all large centers of population for storage of frozen fruit. Emphasis, however, should be placed on the fact that adequate temperatures must be maintained in cold storage warehouses. Temperatures of not more than 15 degrees should be maintained in the room where frozen fruit is stored.

Refrigeration as applied to the retail bring its reward both to the canning industry and to you.

distributors has already been discussed at this meeting. We need only mention that frozen fruit is entirely dependent upon freezing storage for its preservation. Display of frozen fruit at temperatures which will maintain the frozen condition of the product, is, therefore, a necessity.

The temperatures to which frozen products are subjected in the home of the consumer merits consideration. It is probably true that the potential market for frozen fruit in household consumption is represented by the homes that have mechanical refrigerators. However, even with this equipment, it cannot be too strongly emphasized that frozen fruits should be subjected, at all times, to temperatures at which the product will remain frozen. The design of the cold storage compartments in household refrigerators should be such that a limited number of frozen fruit containers may be stored in this compartment.

The infinite skill of the canner in preserving the full flavor and freshness of fruit preserved by freezing will come to no avail without low temperature refrigeration until it is in the hands of the consumer. Careful consideration of the use of low temperature refrigeration in the distribution of frozen fruit will

The Imitation Food Products Co.

(Branch of The Artistic Production Co.)

107 Lawrence Street

Brooklyn, N. Y.

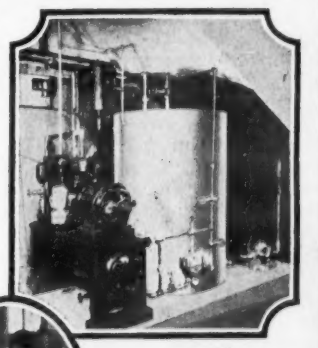
Ask for our catalog of January 1, 1930. Direct sales only. "Indispensable with refrigerator display.

FOR SALE

Nine Patents and two Copyrights. The only ones ever issued covering conductive, non-circulation freezer display cases.

EMMET PLATTEN

GREEN BAY, WISCONSIN



For Drinking Water Systems

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Refrigeration

For office buildings, hotels, hospitals, stores, etc., the central cooling system for drinking water with positive circulation, offers many advantages.

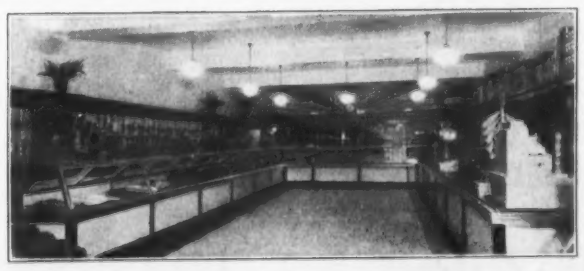
Use Frick Refrigeration for these and other commercial jobs. Capacities from 1-2 ton up. Get the facts on Frick Refrigeration today: write

Frick Company

WAYNESBORO, PA., U.S.A.

The Washington Market, Washington, Pa., Thesco Equipped

QUALITY THESCO SINCE 1870



Here's another job typical of THESCO service to dealers

The Washington Market, Washington, Pa., is one of the most modern and efficient stores of its kind in that city. The equipment for this store was planned and designed by Thesco engineers. Thesco dealers not only have good merchandise to sell, but they also have the co-operation of an engineering and planning staff that is not anywhere surpassed in the technical sales assistance it gives.

A few fertile territories are open. Write for complete proposition and catalogs.

THE C. SCHMIDT CO.

JOHN AND LIVINGSTON AVENUE CINCINNATI, OHIO

SNYDER

Testimony at Washington Hearing

(Concluded from Page 4, Column 5)

put through this process immediately upon arrival at the wharf, are very much better when served in St. Louis or Kansas City, than a subdivision of the same lot of fish caught at the same time served at Boston 48 hours after they arrive there.

Q. Why?

A. Because the flavor is preserved: and we are waking up to the fact that flavor disappears from many items very steadily and sometimes rapidly Most of us are familiar with the disappearance of green peas a few days after they are picked in the garden. But I never hoped to find a piece of pompano in New York or Boston, because no matter how well it was packed in Florida or the Carolinas and sent to Boston. the flavor. which is strong in that fish when taken from the water, is perfectly absent. while the fish is sweet; the fine flavor has gone. So this process is going to be valuable in preserving goods at their highest point of flavor.

Q. As a result of this process, has there been any noticeable increase in or return to the activities in the fish industry?

A. There is a very great increase. There is where the first rapid development took place, in Boston, a small plant in Gloucester belonging to the Birdseye Company. They offered goods to people who were not distributors of meat at the time. In last September they sold 1,500,000 pounds of fresh wasteless fish, which took two and three-quarters millions pounds of fish that came in in the fishing trawlers to produce. So I think it illustrates the value of the principle and what it will be eventually as applied to other fresh food, fruits, vegetables, and so forth.

Q. Has there already been a noticeable increase in the extent of fishing facilities?

A. We were selling trawlers at the close of the war because we had no use for them, but we have been building them ever since.

Q. As I understand it, Birdseye has no monopoly on this process; there are other processes now in operation that come under the head of quick-freezing?

A. I am quite familiar with half a dozen of them, and I am quite sure there are quite a number besides that.

Q. Is there anything to be added to what you have already said regarding the reduction in cost of cutting and in retailing which will follow?

A. As to the cost of operating a grocery store, these figures are not official, but they are the result of some examination on the subject in a limited area. Apparently the cost of operating a grocery store is about $2 per hundred: the cost of operating a retail meat market. not selling groceries but doing the usual custom cutting, carrying the usual extent of that type of business, is somewhere from three to four times as much per hundred pounds as the cost of operating a grocery store. The cost of operating the meat section of a grocery store, under the new plan, will be, apart from that, from 25 cents to a dollar a day, according to the size and quality of the display case involved, including the depreciation of that display case. That cost of 25 cents to a dollar a day for operating a meat market in the grocery store would be the same as the grocery business itself, and will, therefore, make it possible to offer meat in thousands of new places, this certainly to the advantage of raisers of meat in the West and also to the advantage of the distributor; that is, the packer, because there will be a field for that which must, however, be met by a new deal; there must be some new method of handling the situation which is going to make these radical changes.

Q. This refrigerator case which you have described that is to be placed in retail stores, or which has already been placed in some, does that, in addition to keeping the package quick-freezing foods at the temperature necessary for preservation over a period of time that you have told us it can be preserved without loss of flavor, also display to the customers in the store what the goods are on sale?

A. It does.

Q. Will you tell us how this situation will affect the large packers? For instance, you know that the large packers today not only cannot directly have retail meat markets, but they cannot indirectly in any way be interested in retail meat markets.

A. I do not see how the process can be carried forward with any rapidity for the benefit of either the public or the packers or the stock raisers, unless all the packers have the same freedom of action with respect to this matter that the intermediate packers have and the chain stores themselves have.

Q. Is there going to be necessity of financing the small retailer, for instance, by assisting in the acquisition of this refrigerating case, or even supplying it?

A. I should suppose if he were free to do so, that would be one of the first activities of the leading packer.

Q. Is there any business being done in this quick-freezing process with general store organizations?

A. No; it has not been realized by General Foods yet. Fish is being sold to some extent, but it has not been realized by General Foods with respect to other items.

Q. Without the use of this process, has there been any disinclination to have those departments in the same place with fresh meat?

A. Yes; on account of odor.

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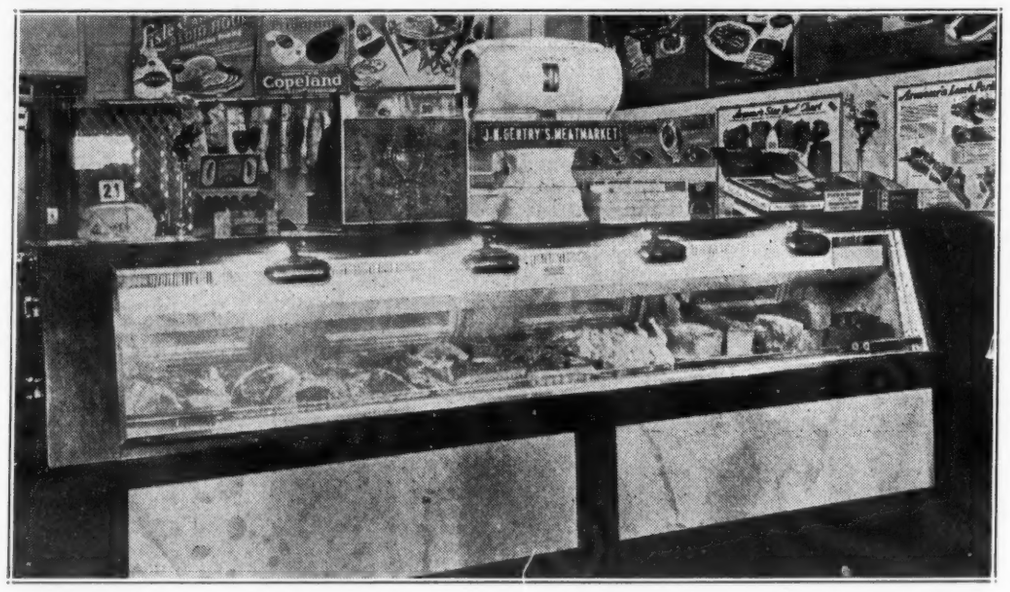
Big Volume and Low Costs

This case in the market operated by Harlon Bros. and Company is attracting much attention. It is kept well filled at all times.



Copeland - Warren Igloo in a Piggly Wiggly store operated by J. N. Gentry. The display allows for a large layout of products.

Harrisonburg, Va.—The Piggly Wiggly Store and Harlon Bros. and Company of this city have recently installed Copeland-Warren Igloo cases in their meat markets. The Peoples Hardware Corp., Copeland dealers, made the installation.

These markets handle locally killed beef, delivered at a temperature as high as 80 degrees. No other refrigerator storage is used except the Igloo cases, and as their volume of business is large, a heavy cooling load is placed on the refrigerating equipment.

A model R (air-cooled) compressor is used with each case, and a 10-W Copeland-Larkin coil. These cases are Warren Igloo No. 1110.

Temperatures are set to suit the owners. One case maintains temperatures 34 degrees to 36 degrees; the other 28 degrees to 30 degrees. Inasmuch as a large quantity of fresh meat is continually passing through the cases, the coils are defrosted daily. It takes from 10 to 20 minutes to defrost and this is done without a noticeable rise in case temperature.

In spite of the heavy demands made upon this equipment, operating costs have been low. The Piggly Wiggly Market averaged only 34 cents per day for operation, and the other store averaged 31 cents, according to the operators.

APARTMENT BUSINESS STRONG

New Haven, Conn.—The need of refrigeration in modern apartment houses is being realized more and more in this large college town. Modern Home Utilities, Inc., 1102 Chapel Street, General Electric dealers, has recently secured contracts to install a total of 28 units in three buildings, with more to follow, according to Miss Anne Johnstone, assistant manager.

Installation of 14 refrigerators of the S. 42 type has been started in the apartment building at 1172 Chapel Street, owned by James D. Kauffman.

In the Philip Marcio Apartments, Elm Street, West Haven, a total of 31 G. 40's were installed last year and nine more are now being added.

Five additional refrigerators of the G. 55 type are now being installed in the Morris Podoloff Apartments, Whitney Avenue. Twelve were put in last year.

THREE TEMPERATURES

Fond du Lac, Wis.—The Erickson Electric Company, Copeland dealer for Fond du Lac County, recently completed an unusual installation in the newly built market of the Harry F. Eaton Company.

A large sized glass door grocers' refrigerator and two 8-ft. Leser porcelain display and storage counters are equipped with non-frosting 100 per cent vertical surface Copeland-Larkin coils, connected to an XA 1,200-lb. capacity Copeland condensing unit.

This installation carries three different temperatures, one counter being constructed to hold low temperatures when the time arises for the handling of quick-frozen package foods.

The Eaton Company operates five modern markets in Fond du Lac, and this is the first Copeland installation.

COOLING THE CUTTER

Kansas City, Mo.—The Copeland Refrigeration Co. recently installed Copeland-Larkin coils, 108-C and 106-C, with an XA compressor in J. A. Lukey's Meat Market. The meat block is within the cooler and the cutter works in the cooled enclosure, thus avoiding much handling of meat and much changing of temperatures as is the case where a piece of meat is taken out and put back into cooler every time a cut is made.

SPRINGFIELD

Springfield, Mass.—Increased sales of Birdseye Frosted Foods are reported this month at the retail stores handling these products. The lower-priced orange label line has proved a substantial aid in swelling the volume of sales, but in many of the stores the blue label line is more than holding its own in the favor of customers. A large business is done with the week-end specials. For the week ending Nov. 15 these included, for the blue label, lamb chops at 49 cents a pound, leg of spring lamb, three-quarter boned, at 39 cents a pound, and boneless rolled rib roast of beef at the same price; and for the orange label, boneless pot roast at 29 cents a pound and stewing beef at 23 cents a pound.

Intensive study in the problem of better refrigeration for the products in the stores is being made both by General Foods representatives and the merchants. At present the trend appears to be toward the use of ammonia. An installation of large Hill Dry-Cold cabinets has been made in the Winchester Square, Dickinson Street and Longmeadow stores of the Thrift Store chain.

The fact that the use of these foods is constantly increasing despite the depression that affects many lines of trade rather severely is regarded as a most encouraging development. New additions are expected to be made to the Birdseye list this month.

RECENT COMMERCIAL JOBS AT BRIDGEPORT

Bridgeport, Conn.—Connecticut Butcher Fixtures Manufacturing Company, 105 Parallel Street, has been doing a good volume of business in walk-in coolers.

Recent installations are as follows: Stephany Bros. Market, Main Street, South Norwalk, 7 x 7 x 10 ft. cooler, with Frigidaire unit supplied by Connecticut Light & Power Company; Fritzen & Son, market, Main Street, Norwalk, 8 x 8 x 10 ft. cooler, with Frigidaire unit; Lone Eagle Restaurant, Boston Post Road, Darien, 4 x 6 x 9 ft. restaurant cooler; Darien Farm Rotisserie, Post Road, Darien, 4 x 6 x 8 ft. restaurant cooler, Frigidaire unit by Downes-Smith Company, Stamford; Cowles Lunch, Stamford, 4 x 5 x 10 ft. restaurant cooler, Frigidaire unit.

SAVANNAH

Shows Interest in Frozen Fruits

Savannah, Ga.—Exhibits of fruits and vegetables frozen by the latest quick-freezing methods created considerable interest among Savannah women recently. The products, frozen at the Georgia Experiment Station, Experiment, Georgia, were exhibited at the municipal auditorium during the fifty-fourth annual convention of the Georgia State Horticultural Society, held November 11, 12 and 13.

Although only a part of a large exhibition of flowers, fruits and vegetables indigenous to Georgia, the display, sponsored and conducted by officials of the experiment station, seemed to create more practical interest among the women who visited the auditorium during the three days than any other single portion of the exhibition. They found that the frozen fruits and vegetables were equally as tasty as the fresh products, and that they could be kept almost indefinitely without fear of spoilage. The flavor of the frozen foods was remarked upon and wondered at by the many housewives who inspected and tasted them.

Some of the products had been frozen at the experiment station during the spring, and all of them had been in storage for several months. There were grapes which had been put through the freezing process nearly a year ago. None of the foods had suffered any loss in flavor, a fact thought remarkable by those who tasted them. One feminine connoisseur of table delicacies expressed the opinion that the strawberries which had been in a state of frozen solidity since the spring tasted better than the fresh fruit.

In the display there were fruits and vegetables not only from Georgia, but from other sections. Several varieties of California and Florida fruits were experimented with in an attempt to discover those varieties best suited for the purpose. Among the fruits were two varieties of strawberries; six varieties of raspberries, five of figs, fifteen of peaches, most of them Georgia and California varieties; two of dewberries, seven of blackberries, one of blueberries, one of cherries, four of pears, one of plums, three varieties of grapes, native huckleberries, one of nectarines, and the common market variety of bananas. The frozen vegetables used in the display included from one to two varieties of lima beans, peas, string beans, cantaloupes, tomatoes, watermelons, radishes and asparagus.

Fruit juices frozen in glass and sealed paper containers also were described as delicious by the feminine visitors. The juice of nineteen varieties of grapes had been frozen into solid blocks in various types of containers. Orange and grapefruit juice had also been frozen.

In freezing the grapes and citrus fruits, the skin and seeds had been removed and the juice and pulp frozen. These juices, when converted back to liquids, were no different in taste and appearance from the juice of the fresh product. In the case of the native black scuppernong the juice was better, a peculiar cloying taste which quickly jaded the appetite having been eliminated in the process.

Peaches, sliced and frozen into small blocks with a cane sugar solution, made a delicious as well as healthful confection. The peaches had been sliced thin, soaked in a solution of pure cane sugar and pressed into bars before being frozen. A wrapper of tin foil and tissue kept them sanitary. It was thought by those experimenting along this line that the pure confection might in time take the place of less healthful sweets among children.

The consensus of opinion of those who visited the frozen food exhibit and tried the products in their homes was that the experiment is undoubtedly practical.

A summary shows that forty-eight varieties of fourteen fruits, eleven varieties of eight vegetables, and the juices of twenty varieties of three fruits, all frozen during their season, some of them having gone through the process many months ago, were brought to Savannah in excellent condition and met with the approval of discriminating housewives.

TWO CONNECTICUT DEALERS ADDED BY WESTINGHOUSE

New Haven, Conn.—The Connecticut Electric Refrigerating Company, 149 Temple Street, Westinghouse refrigerator distributors for Connecticut, has appointed two new dealers in the territory, according to Norman K. Fuller, sales promotion manager. They are: Earl E. Berkoff, 119 Franklin Street, Norwich, and the James H. Bunce Company, 378 Main Street, Middletown.

FRICK FOR FOOD STORE

Miami, Fla. — Frick Refrigerating equipment has been installed in the F. and D. Food Stores, Inc., 14 S. E. First Street, by the Dade Refrigerating & Engineering Co.

Automatic Retailing Number

Buyer's Guide Section

In Three Parts
Part Three

ELECTRIC REFRIGERATION NEWS

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TWO DOLLARS PER YEAR

Sodamat Stores Prove Popular In East

Coin-Operated Beverage Shops In New York, Atlantic City

New York, N. Y.—For six years F. E. Gray has been experimenting with automatic, coin-operated soda fountains. Today six of his "Sodamat" chain shops are in existence and thriving.

Two of these one-man drink stores are in Atlantic City, two at Coney Island, and two in metropolitan New York City. They consist of either 20 or 36 drink-dispensing units built into a right-angle marble wall.

Right in the angle of each of these L-shaped shops is located the cashier's window, where nickels are exchanged for other coin of the realm. This cashier is the only attendant around the place.

Cooled by electric refrigeration, these dispensing units serve soft drinks of many flavors at temperatures suited to the relative heat of the day, in large sanitary paper cups, for the modest and unassuming sum of five cents. Each drink is mixed automatically upon the deposit of a nickel in the slot.

Kelvinator Units

Behind the scenes (downstairs in the basement in most of the stores), Kelvinator cooling units of one and two and one-half horsepower capacity are busily at work keeping the carbonated water at the desired temperature.

City water runs into a large tank (144 cubic feet capacity) down there, and the compressed carbon dioxide gas is passed into the water. An evaporator is also present in this tank, and so when the water leaves the tank it is chilled and all ready to be mixed and served.

Brine tanks surround the mixing device, which consists of valves, syrup containers and necessary instruments. This mechanism pours the proper amount of flavoring syrup into a "hopper," which at the same time receives the cooled carbonated water which has been shot up from below.

The syrup and water are mixed thoroughly, and poured into a cup, which has been set in place by another mechanism. Right to the top of the cup the drink is poured.

Eight Seconds

Eight seconds after the nickel is inserted into the slot at the right of the server, the drink is ready for the purchaser. The coin enters an engaging mechanism, which in turn operates valves admitting one ounce of syrup and five ounces of carbonated water into a mixing chamber.

From this chamber the finished drink is delivered into a fiber cup, which in the meantime has been dropped into position under the nozzle and behind a glass door. When the cup is filled, the delivery chamber is illuminated and the door unlocks, thus delivering the drink ready for the customer to lift out.

At the Sodamat factory on West 20th Street (143) the dispensing equipment is made. Here, too, portable Sodamat drink dispensers are manufactured. Another factory, located at 1715 Broadway, mixes all flavoring syrups used by Sodamat vending machines.

Sodamat shop set-ups are all controlled by the parent corporation, and hence all use Sodamat syrups. When purchasing one of the portable units, the buyer must contract to use only Sodamat syrups in the machine.

An idea of the amount of business done by these vending soda fountains may be gleaned from the records of the company. On June 30 of last summer a

(Concluded on Page 2, Column 1)

AUTOFOUNT VENDER USES ICE REFRIGERATION

Washington, D. C.—"Electric refrigeration will greatly reduce the service cost of our product, and we are extremely interested in adding this feature to our machine," states Harry M. Henderson, of the National Autofount Corp.

Built to serve automatically, following the deposit of a nickel, a fiber cup full of "Henderson's Orange," the Autofount vending device is at present refrigerated by ice. This machine is simple, compact, and is finished in porcelain enamel.

German Beer Sold By Machines

Berlin, Germany—Thirsty American tourists who want service right now, if not sooner, need not wait for lackadaisical German beer garden waiters to finish their dalliance with Anna, the beautiful barmaid.

Nickel-plated slot machines, from which flow light and dark beer, wines and brandy, have recently been installed by local burghers and housefraus.

Mechanically-minded Germany is far ahead of the rest of the world in the development of vending machines for all purposes. Almost any small item of food, drink, or general usefulness can be purchased here by dropping a coin in a slot and turning a crank or pressing a button.

CO-OPERATION

New York, N. Y.—Co-operating with Standard Oil, Texaco, and Orange Crush officials, the Surbrug Chocolate Corp. of 77 Chambers Street is burning gallons of midnight oil in the attempt to produce efficient refrigerated food and drink vending machines.

One device, which will vend bottled drinks, is already in production. Others, all mechanically refrigerated, and adapted to the retailing of many varieties of perishable foods, will follow shortly, according to Surbrug executives.

The thousands of filling stations which dot the countryside, villages, and cities of the nation are considered a good market for refrigerated food and drink vending machines, officials of the Surbrug Corp. believe. Roadside barbecue and soft drink stands offer a similar market of high potentialities.

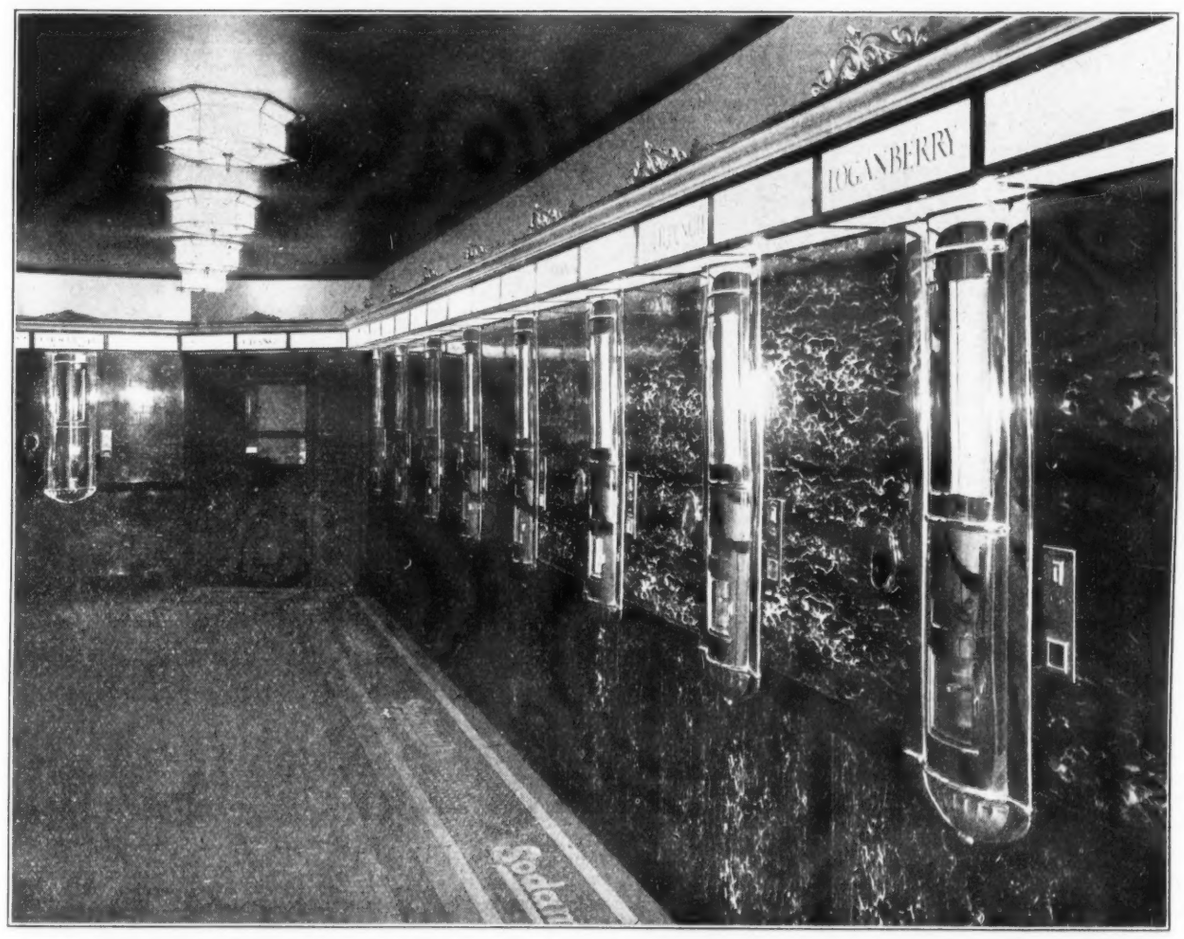
London Now Buys Food At Night

London, England—Perishable goods cannot be sold in London shops after 8 o'clock in the evening. Severe fines are assessed upon shopkeepers who violate this law.

Nothing in the statutes says anything about vending machines, however, so slot machines are doing a big after-dark business here in the merchandising of foods.

Cheese, pickles, ham, beer, sausages, butter, tea, sugar, fruit, and other perishable foods are sold by mechanical robots here and elsewhere in England. By inserting a sixpence or a shilling, late shoppers can get almost anything they want to eat from these machines, which do a land-office business.

Sudden Service



Speed and economy in serving beverages are provided by Sodamat stores like the one above.

Orange Juice Equipment Made By Hamilton

Chicago, Ill.—Automatically controlled, mechanically refrigerated orange juice portable counter and counter-top dispensers are manufactured by W. A. W. Hamilton & Sons.

Also manufactured by this concern are sealing machines, crushing machines, and storage vats for orange juice, as well as the orange juice itself. Orange drink stands are maintained by the Hamilton company at various points around Chicago.

Autodrink Devices Vend 30,000 Per Day

New York, N. Y.—An average of 30,000 drinks a day was sold by Autodrink vending machines in New York subways during the month of August, state officials of the Autodrink Corp. Fifty-five ice refrigerated machines established this mark.

Ten-cent stores and railroad stations are among the best-paying locations for products of this concern.

Eskimo Pies Are Cooled In Thermos Jugs

Louisville, Ky.—Both Dry-Ice and the thermos-jug principle are used to keep Eskimo Pies cold in the containers merchandised by the Eskimo Pie Corp., of this city.

These jars will keep from 32 to 15 dozen Eskimo Pies (according to jar size) for 24 hours. The smaller sizes use from 14 to 16 ounces of solidified carbon dioxide, while the larger jars use from three to five pounds of this refrigerant during the 24-hour period.

Looking Forward and Backward

Past Buyer's Guides

July 30—Office Equipment. This number demonstrated how modern office equipment can be integrated and adapted to the needs of electric refrigeration firms.

August 13—Delivery Equipment. Motor trucks and handling devices were discussed, with emphasis on the delivery problems of the dealer.

August 27—Electrical Advertising. How dealers can identify their stores by effective lighting was told in words and pictures.

September 24—Oil Burners. Related merchandise which will offset seasonal fluctuations was brought to the attention of the dealer in this issue.

October 8—Radios. Another line of related merchandise, which has been hooked up with electric refrigeration by many leading organizations, was considered.

October 22—Metals. Intended primarily for the manufacturer, this number told the story of the various metals which are used in the making of electric refrigerators.

November 5—Production Tools. Examples of modern production equipment were pictured and discussed in this "pink section," which contains an unusually large and complete directory.

November 19—Automatic Retailing. In this issue a new industry with which the electric refrigeration industry can profitably cooperate is brought to light.

Coming Buyer's Guides

December 3—Refrigeration Cabinets. This issue is especially directed to the attention of architects. Descriptions and specifications of all styles of domestic and commercial refrigeration cabinets will be included, along with a chart showing complete specifications of stock size cabinets manufactured by leading companies.

December 17—Refrigeration Machines. Detailed descriptions of refrigerating units and a complete list of all companies manufacturing them will be provided in this issue. Also included will be a chart featuring complete specifications of refrigeration systems made by leading concerns.

New Distribution Methods Are Coming

Mechanical Refrigeration Hastens Automatic Retailing Advent

AUTOMATIC retailing is coming. The once-despised slot machine, introduced to America in 1888 by the Adams of "Tutti Frutti" gum fame, has attained a dignity and a substantial character commensurate with its age and the experience of its promoters. Now that electric refrigeration is being applied to vending machines, the pathway toward widespread mechanical merchandising seems cleared of its most serious obstacles.

For many years manufacturers have been expressing a growing dissatisfaction with retailing methods. Sales outlets have often been able to keep pace with production. Goods have become standardized and uniformly priced, and national advertising has created wide public acceptance for them; yet the merchandising of these products has rarely been able to cope either with the demands of the manufacturer or the consumer.

Mechanical Clerking

The elimination of the personal element in selling a customer an advertised article, as to the merits of which he is already convinced, has made store-clerking more or less a mechanical matter. Why not let machines, it is argued, do the job of handing over to the customer what he wants?

Dr. Glenn Frank, highly publicized president of the University of Wisconsin, writes: "In the thoroughly efficient store of the future, all standardized, well-known and commonly used articles will be sold through machines, and human ingenuity will be used only where salesmanship is really needed."

This great transformation, he says, "will tend to convert the salesman from a mere bundle wrapper into a counselor in consumption, thus lending a new significance and dignity to his job." It will also prove to be "an inestimable boon to the small retail merchant, for he will be able to conduct a larger business with a smaller staff."

Economically Sound—Babson

"Why is it necessary," asks Roger W. Babson, the business statistician, "to take up a sales person's time when you are buying Smith Brothers Cough Drops, Three-in-One Oil, Gillette Blades, Williams' or Mennen's Shaving Soap, Lucky Strikes, Fatimas, Camels, etc.? The coin-in-the-slot principle is economically so sound that if coins such as 15-cent pieces would increase convenient purchase the government should mint them."

"This basic principle," he continues, "ought to be readily applied to a great variety of products besides gum, cigarettes, etc., and sales ought to increase five-fold or ten-fold in a short time."

The application of electric refrigeration to automatic merchandising machines has opened to this method of retailing the wide and rich field of perishable foods. People must always eat, and the one thing that can be sold at all hours and all places is food.

In past years vending machine makers have attempted to market such staple foods as sandwiches and pies in their machines, but found that spoilage usually stopped sales. Refrigeration, according to vending engineers, will provide the solution to this problem.

At present the vending of perishable foods is chiefly confined to beverages and ice cream. Manufacturers of these products have been quick to see the ad-

(Concluded on Page 5, Column 3)

SINTZEL MILLS DISPLAY REAL ORANGES

Los Angeles, Calif.—Those mammoth imitation oranges, with a window in the center showing real oranges rolling down into a grinder from which spouts orange juice, are manufactured by the Sintzel Orange Mill Co., of Venice, Calif., which town has recently been incorporated into the city of Los Angeles.

Many of the orange drink stands which feature this machine use electric refrigeration to cool the juice it extracts, according to G. Horner, general manager of the company.

Thirsty Easterners Enjoy Sodamat Beverages

(*Concluded from Page 1, Column 1*)

Sodamat store was opened on the Boardwalk at Coney Island. This store sold as many as 17,170 drinks in a single day. Its total sales for the first month amounted to 170,805 drinks.

A 25-unit store was opened July 6 at Pennsylvania Avenue and the Boardwalk at Atlantic City. During the 25 days following its opening 178,823 drinks were sold.

Still better records were hung up by this store during the summer. On Saturday, August 9, for instance, it sold 12,947 drinks, and followed up the very next day with sales of 21,265 thirst-quenchers. That made a grand total of 34,212 nickels poured into the slots of this shop by Atlantic City habitues and casual visitors during the two-day week-end.

Top position in the daily sales volume records was attained by this lively Atlantic City store Sunday, Aug. 31, when 22,307 cash customers paid five cents each for every drink they took from its coin-operated fountains. As many as 3,600 drinks an hour were served by this shop.

For the month of July the total sales for four Sodamat stores were 489,203 drinks, and for August, 519,626 drinks. Despite the addition of a fifth store during the latter part of September, cooler weather pushed the sales during this month down to 304,693 drinks. For the three months a total of 1,304,917 sales of drinks was established.

President F. E. Gray of the Sodamat Corp. estimates that the six stores now in operation should sell six million five-cent drinks next year. Moreover, he plans to open more stores in the metropolitan area, to be followed later by an expansion over the East, and still later by the installation of stores in the Middle West.

Also among the plans of this company are designs for other automatic food-vending machines, which will sell five-cent candies, confections and the like. These machines will be installed in all Sodamat stores. Hot drink dispensing machines are also under experiment.

"Electric refrigeration solved one of our biggest problems," says Mr. Gray. "Keeping a constant, even temperature in our carbonated water storage tanks was a tough job with ice; but now we simply set a thermostat and go off and forget the whole business.

"Other major difficulties included variations in cups, and the control of the specific gravities of the various syrups. We feel, however, that our mechanical worries are pretty well licked now. A tremendous market for refrigerated food-vending apparatus looms ahead."

G. E. Coolers Used For Fruit Drinks

St. Petersburg, Fla.—Domino Citrus stores, located in this city and the neighboring towns of Bradenton and Sarasota, serve pure orange juice and grapefruit juice. Recently these three stores have purchased and installed eight G. E. acid-proof bottle coolers.

Four of these bottle coolers were installed in the St. Petersburg store, while two each went into the stores at Sarasota and Bradenton.

Built into the orange-tinted counters of these stores, the bottle coolers keep at constant temperature the fruit juices sold by the stores. The juices are ready to serve, and the attendants merely fill up glasses directly from the coolers.

Modernistically designed are these stores. Orange is the dominant color. Large black dominos are painted upon the walls, and more black dominos are inlaid on the floor linoleum.

AUT-O-CREAM MACHINE SELLS ICE CREAM

Yonkers, N. Y.—George A. Brayman, of this city, is the inventor of the Aut-O-Cream vending machine, designed to retail packaged ice cream. As yet Mr. Brayman has not arranged for the production of his machine.

This vender is both coin-operated and electrically refrigerated. Among its features are a visible indicator which registers the supply of ice cream packages, and a coin-return device which works when the machine is empty.

FRIGIDAIRE CO-OPERATES WITH CUPTOR CORP.

New York, N. Y.—Frigidaire has been working hand-in-hand with engineers of the American Cuptor Corp., of 200 Hudson Street, according to officials of the latter concern.

The result has been the production of a mechanically refrigerated orange drink dispensing device which may or may not be coin-operated.

Automat Restaurants Popular

New York City cafeteria patrons have long enjoyed the food economies made possible by eating at automatic restaurants. Food sold in this manner is kept sanitary and fresh. Above is shown a restaurant on 52nd Street in New York, equipped with electrically operated vending units by W. D. Beardsley.

Food Retailing Device Now On Market

New York, N. Y.—If you like the Automat restaurant idea, you can install one in your own home town. W. D. Beardsley, who is located in room 903 at 535 Fifth Avenue, is marketing electrically-operated vending machines for restaurants.

These machines display food in sanitary, lighted compartments. The patron chooses what he wants, deposits the necessary amount in the slot, and opens the compartment by pushing a button. The compartments are immediately refilled by an attendant in the rear of the machine.

"Rapid, economical and sanitary service for the restaurant patron is provided by equipment of this type," says Mr. Beardsley. "It saves time in serving food, eliminates waiters and tips, protects food from the dangers incident to exposure on open counters, and offers an attractive display medium.

"Serving food in restaurants by means of automatic machines has been practiced successfully for many years in New York and Philadelphia. The same method could be adopted in any community where there is a heavy concentrated demand for popular-priced food."

THERMOS URNS DISPENSE COLD LIQUIDS

Norwich, Conn.—Liquid dispensing urns of three and five-gallons capacity are offered to the trade by the American Thermos Bottle Co. These urns will keep liquids cold for three days or hot for two.

Casing, legs and tray are all of aluminum, the top and faucet are chromium-plated, and the liner is of heat-resisting "pyrex" glass. The urns are finished in "Duco" or nickel plate.

Cold!

In five seconds after a nickel is dropped in the slot, the Autofount will produce a cooling drink.

Bell Bulk Drink Vender Has New Features

Philadelphia, Pa.—Production of a new type of automatic coin-operated beverage dispenser is contemplated by Harry A. Bell, of 541 Clapier Street. Mechanical refrigeration will be one of the features of this machine, although Mr. Bell has not yet decided upon the unit to be employed.

The dispenser takes a supply of cooled water, a supply of carbon dioxide under compression, and a supply of syrup of any flavor. In the carbonating of the water the usual motor and pump are eliminated. Valves and mixers, having just one moving part, accomplish the task.

A single stroke of the manually-operated exterior handle (which is locked until released by the deposit of a coin) mixes predetermined amounts of water, carbon dioxide and syrup, places a paper cup, and discharges the mixed drink into the cup.

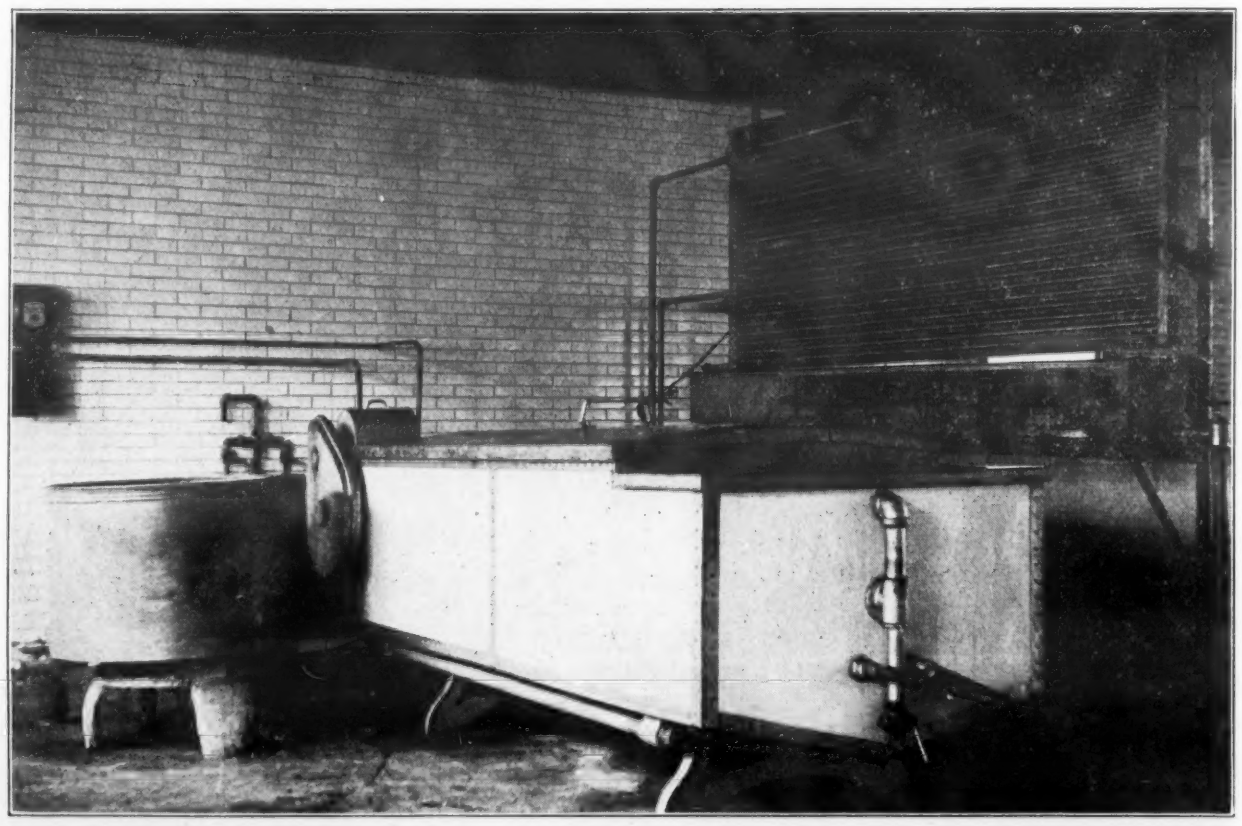
When the machine is not in operation nothing is exposed but the handle and the coin slot. Upon the moving of the handle a door opens in the front of the machine, from which the beverage-filled paper cup may be removed. After the drink has been taken out, the door is automatically locked again.

CORDLEY KOLDSTREAM IS SMALL, COMPACT

New York, N. Y.—Distinguished by its small stature, the Cordley Koldstream electric cooler has been adapted to the dispensing of many bulk beverages.

Present models are only 40 inches high. New models, even more compact, will be exhibited shortly after the first of the year, according to E. Bana, of Cordley & Hayes.

Behind the Scenes



Above is pictured a Hamilton orange juice cooling equipment installed in a Chicago drink dispensing shop. Oranges are crushed by a machine which is upstairs. The extracted juice drops by gravity into the cooler shown at the right of the picture. Circulating brine and a direct expansion methyl chloride system cool the tubular coils. The cooler discharges into a receiving vat, where the juice is kept below 33° F. until used.

Vending Cafeterias Successful In New York

New York, N. Y.—Messrs. Horn and Hardart don't believe in halfway measures. Buy a vending machine and sell a dozen candy bars a day? Buy another machine and sell a few sandwiches? Not for them. These enterprising gentlemen have established a chain of restaurants and equipped them completely with coin-operated automatic retailing devices!

Automat restaurants, operating chiefly in the Greater New York area, have been successfully merchandising food for more than a decade. New Yorkers caught the idea quickly, and patronizing these self-serve emporiums has become a habit with many thousands of quick-meal seekers.

Vending units, each containing glass-front shelves which display articles of food, line the three walls of these restaurants. A booth, from which small change to operate the units may be had in return for bills and larger silver pieces, is located near the entrance. Tables and chairs fill up the floor area.

Divided into sections, such as "Bread," "Pastries," "Meats," "Sandwiches," "Salads," "Beverages" and "Desserts," these units display three or four different articles of food on their shelves at a time. The customer drops the required coin in the slot, the glass door opens, and the food can be removed.

After the customer has closed the door, the vending unit shelf executes a right-about-face, and an attendant stationed behind the row of units places another cut of custard pie (or whatever it was that the customer removed) on the empty shelf.

Just as in a cafeteria, the customer walks down the lane, looks over the wares, and fills up his tray. The big difference is that he pays for his food as he goes along, rather than waiting for some human lightning calculator to glance at his tray and punch out the total price on a ticket.

As yet mechanical refrigeration has not been utilized by these Automat restaurants. The foods which require refrigeration while reposing in the units are cooled by ice, which is packed around the unit itself. Most of the food articles move so quickly that refrigeration is scarcely necessary.

Siphonmix Fountain Coin-Operated

Kansas City, Mo.—"The application of electric refrigeration to vending machines is going to do a great deal to speed up the arrival of nationally accepted automatic retailing," says M. E. Whitney, national distributor for Siphonmix fountains and dispensers, produced by the General Products Corp.

The Siphonmix machine will serve 128 five-cent drinks to the gallon of carbonated beverage. It is coin-operated and contains also a burglar-proof cash register. Present models are ice-cooled.

Duco-finished metal cabinets for this machine are trimmed in nickel, and include two glass mirrors and a glass which displays the supply of individual fiber cups. Its height is 72 inches, with 26 inches, and depth 18 inches.

The Junior Siphonmix is designed for soda fountain use and is not coin-operated. It will mix and serve two different flavors of drinks automatically, and is operated by the push of a button. Ice refrigeration is used at present on this model also.

ADVANCE MANUFACTURES COIN DEVICES

Chicago, Ill.—In the last 30 years the Advance Machine Co. has manufactured and delivered just 78 coin-operated venders for selling foods other than candies. Most of these have been used to merchandise sandwiches, according to officials of the concern.

The Advance Machine Co. specializes in manufacturing the coin-operating devices used in vending machines, and leaves the job of making refrigerated cabinets for perishable foods to the purchasers who are interested in machines of that type.

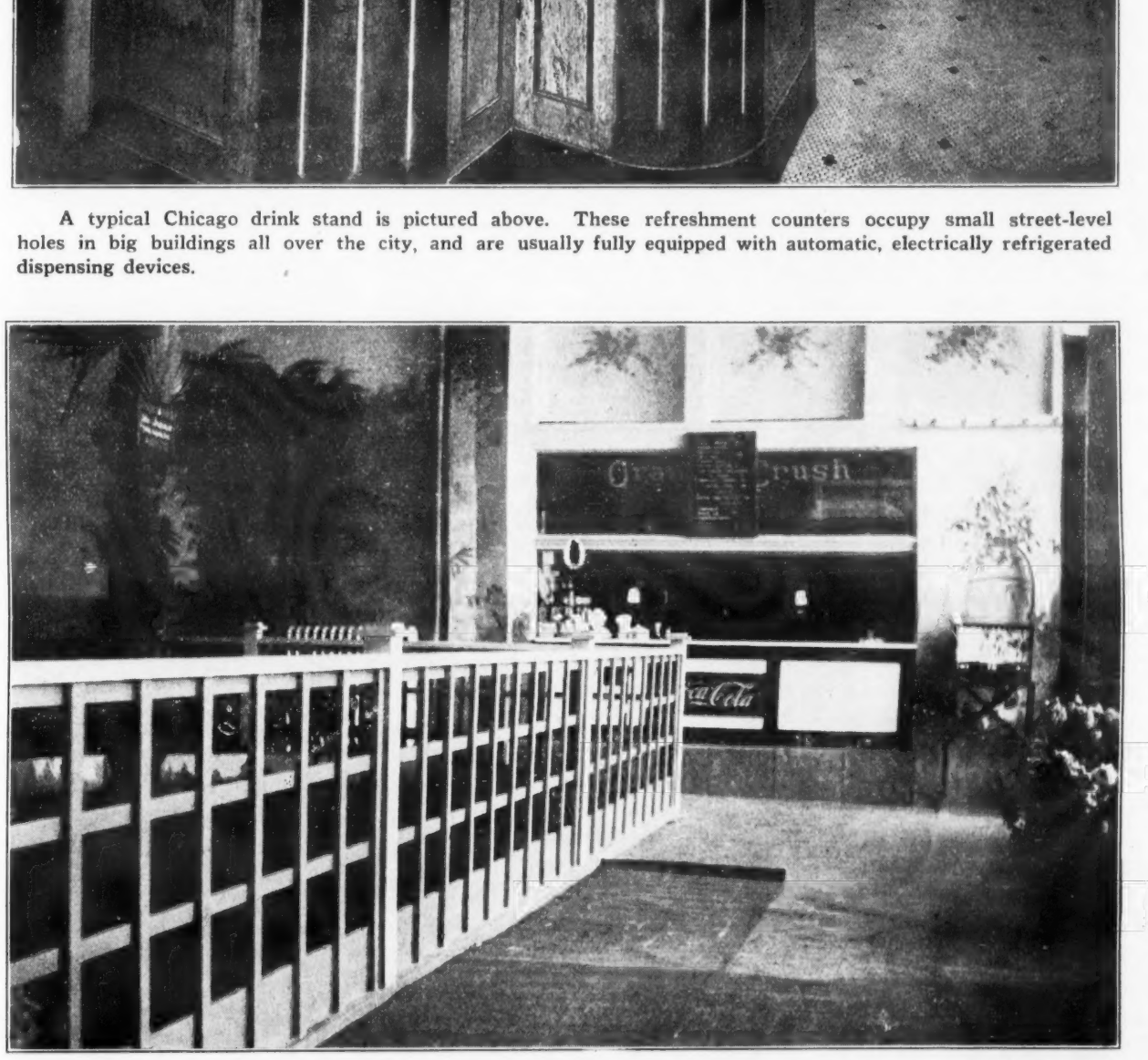
MILK OR COFFEE KEPT BY CORNINE CABINET

New York, N. Y.—Either milk or coffee may be vended by the Cornine thermos-type machines now being marketed by the Cornine-Hakanson Die Casting Co., of 225 Fifth Ave., according to D. A. Cornine, of that concern.

Other food-vending machines are made to order by this company. Messrs. Cornine and Hakanson report that very few orders have been received for refrigerated cabinets, and that thus far their thermos-type machines have supplied every need.

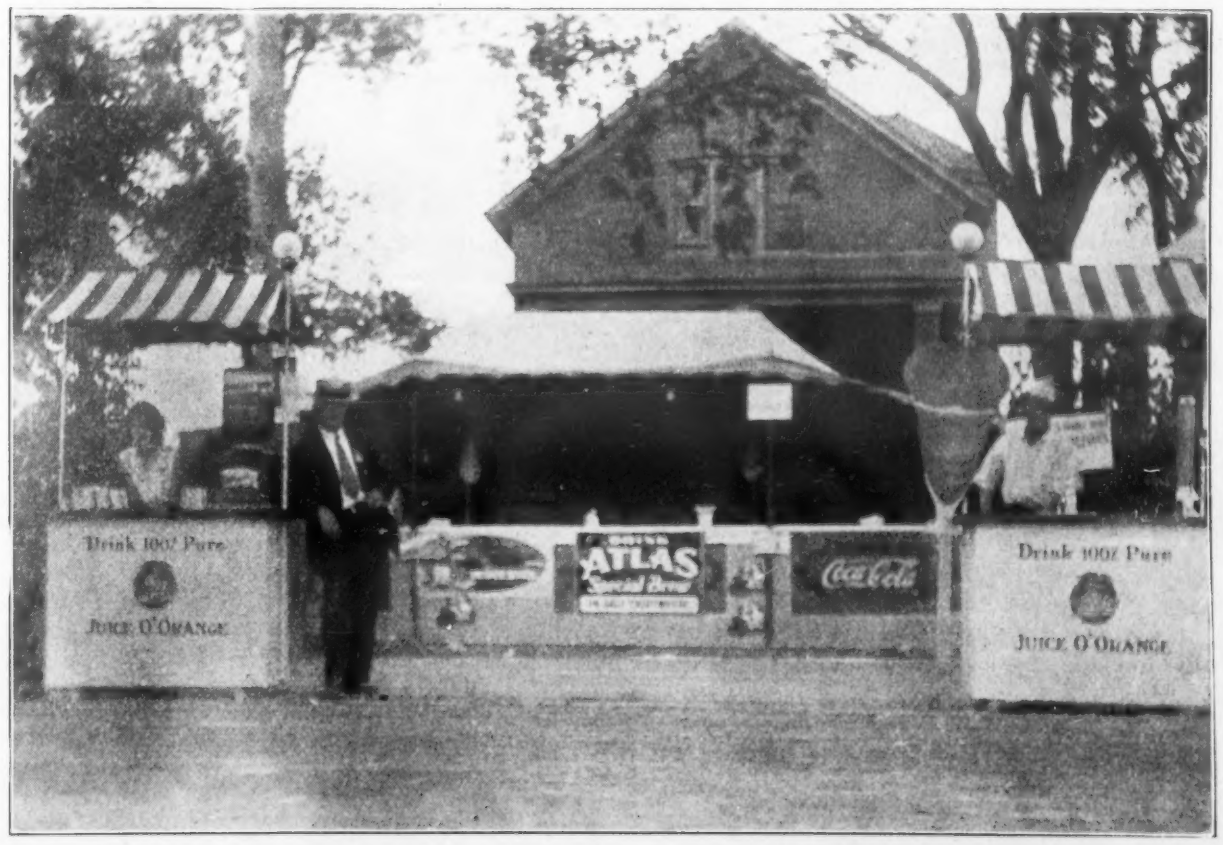
Refrigerated Drink Venders Seen in Variety of Places

Almost no limit appears to the possibilities of extending the services of electrically refrigerated beverage dispensers. Wherever men go, they must eat and drink. Automatic drink venders are sanitary, handy, and economical, and never fail to draw a good patronage wherever they are placed. Electric refrigeration is already widely used for cooling beverages in stands and soda fountains which have attendants to wait upon the thirsty customer. From the portable stand shown above to the entirely automatic soda fountain in the picture below, electric refrigeration has helped make beverage merchandising relatively trouble-free. The pictures on the right illustrate only a few of the many places yearning for drink dispensing machines. Grocery stores, factories, clubs, hotels, cigar stores, department stores, theatre lobbies, billiard parlors, amusement parks, dance halls, filling stations, transportation terminals, shining parlors, drug stores, bowling allies, cafeterias, barber shops, and office buildings are all good locations for refrigerated thirst-quenching devices.



A typical Chicago drink stand is pictured above. These refreshment counters occupy small street-level holes in big buildings all over the city, and are usually fully equipped with automatic, electrically refrigerated dispensing devices.

Miniature golf took the nation by storm this year, and courses have been established in cities, towns, villages, and hamlets in all sections of the country. With the coming of winter they have moved indoors. These "inside links" offer a fine opportunity for cashing in on automatic beverage retailing.



In the good old summer time many a farmer's wife and daughter make pin money by selling food and drink to tourists and joy-riders. Drink vending machines cooled by electric refrigeration are more than welcome at these roadside stands, where a constant supply of ice is often unobtainable.

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Heralding the Automatic Era

DISTRIBUTION has long been a painful and stubbornly adhesive thorn in the side of the industrial system. Dr. Julius Klein, able director of the U. S. Bureau of Foreign and Domestic Commerce, estimates the distribution waste in the United States at $8,000,000,000 annually, and lays the blame for this serious leak in the dike at the door of "the efforts of our business machinery to make headway with the present combination of scientific mass production and haphazard antiquated distribution."

Fortunately, the engineering brains which made our present efficient production methods possible have recently been directed toward the field of selling, and developments of the last few years are convincing economists that the era of automatic retailing is at hand. Machines placed at the point of delivery as well as at the point of origin, it is believed, will help prevent the mighty stream of manufactured, packaged, and advertised goods from becoming dammed up before reaching the consumer.

National advertising, with its attendant train of uniformly dressed and priced goods, has already turned much of the retail clerk's job into a mere manual operation, and has made bundle-wrapping the only test of his skill. The customer who wants a package of cigarettes, a cake of soap, or some other staple, fast-selling, low-priced article, has already made up his mind (or had it made up for him by a clever copy-writer) as to the brand he desires, and simply points to object he desires. Personal selling in this case is not only unnecessary; it is objectionable. For the consumer, the vending machine which gives him what he wants without delay is indeed a boon.

The retail merchant finds it a blessing also, for it allows his salesmen to devote their time and energies to the merchandising of goods which by their nature require intelligent specialty salesmanship. Moreover, automatic retailing prevents the loss of sales caused by impatient customers who want a standardized, advertised article, but cannot be waited upon quickly enough. Still more important, the retailer has learned that when a clerk does wait on an already-sold customer, the merchandise carries a double sales cost—the advertising which sold it and the clerk who delivered it.

Consumers and retailers are not alone in reaping the advantages of mechanical selling. The manufacturer, perhaps, walks off with the lion's share of the benefits. He must not only fight desperately for a visible and easily accessible place on the shelves and counters of retail stores, and risk being supplanted by a more aggressive competitor, but he is also faced with the problem of securing intelligent representation by salesmen. The installation of vending machines assures the manufacturer that his goods will be displayed properly, carry the message he wants to convey, and be available to all comers at all times.

An answer to the problem of more efficient distribution has been brought forward in the form of highly educated progeny of the once-lowly slot machine. No longer do coin-operated devices suffer from indigestion, or work spasmodically. Vending machines will now vomit washers and other extraneous material, are safe from both marauders and dishonest servicemen, and have attained a genuine beauty and dignity of appearance. Some of them will even talk.

The application of electric refrigeration to vending machines is probably one of the most important steps of all in elevating the status of the slot machine to the noble station of automatic retailing. A whole new realm is thus annexed to the present somewhat narrow field of goods salable by machines. The addition of perishable foods to this class of vendable goods should receive a transatlantic flyer's welcome from food producers. Packaged quick-frozen meats, vegetables, and fruits, which are now in the developmental stage, are made-to-order for some enterprising vending machine manufacturer who understands the application of electric refrigeration to his cabinets.

Already automatic cafeterias and soda fountains have proved profitable, and if restaurant managers continue to standardize waitresses (in many places they are now dressed alike, allowed to utter nothing but specified rubber-stamp sentences, and distinguishable only as blondes or brunettes) it will be a matter of just a few short years until robot-served meals will be upon us.

Although the Automatic Era is as yet barely visible over the horizon, its eventual arrival seems as certain as the approach of Christmas. Co-operation between the vending machine and elcetric refrigeration industries will grease the wheels for the coming of the long-awaited revolution in distribution methods.

Off Duty in New York City

By GEORGE F. TAUBENECK

First impression upon alighting recently in New York City: apples. Second, third, fourth, and so on ad infinitum impressions upon wandering around New York for several days: apples. Last impression upon leaving New York: apples.

Orchard owners throughout the state of New York have been faced with a surplus of apples this year. New York City is wrestling with a surplus of job-hunters.

Somebody got the bright idea that each group could help the other, and so we have the spectacle of half a dozen apple salesmen stationed in every block of the metropolitan business districts.

Any man, woman, or child may go to the apple-growers' headquarters, and get a consignment of big, red, juicy doctor-chasers. Applicants are trusted.

When they sell the first box, they come back for more apples, pay for the original bunch out of the proceeds, and pocket the difference. Most of these neophyte salesmen are honest, the records show.

The New York Police Department has given this apple-selling army permission to hawk its wares without license and without molestation. At any place along the sidewalk these salesmen may set up their boxes of apples and signs reading: "Unemployed. Buy apples."

Somehow, the sign seems a bit fishy. How can a man be unemployed when he is selling apples all day, and keeping almost half of all he makes? Anyhow, they're good apples.

Old folk, gay young blades, Poles, Scandinavians, Irishers, unshaven yeggs, pink-cheeked boys, wrinkled and scrawny old women, fat women in gingham and sailor hats, middle-aged men who appear to have spent most of their days with their feet on office desks—the clan of apple-sellers embraces all classes, creeds, and conditions.

A few do a real job of intensive personal selling. Others drone, "ap-puls, ni-i-ize ap-puls," interminably. Most of them merely stand beside displays of the great New York fruit and wait for business to happen.

"I've been in a lot of cities where unemployment was a serious proposition," a fellow-visitor said to us, "but New York is the first place I've encountered which advertises the fact that many of its citizens need work."

His observation gained more and more proof as we walked down the street. Not only were the apple-venders advertising that they were supposedly unemployed, but most of the store-windows carried messages relating to the situation, and how they were meeting it.

An old Spanish monk once wrote in a rare little volume entitled, "The Art of Worldly Wisdom," this aphorism: "Never show your sore thumb."

Manhattan, supposedly as worldly wise as our modern dancing daughters, not only keeps its wound on display, but calls the world's attention to it with raucous outcries.

Lest we be chided for having a cold heart in looking at New York's unemployment advertising thusly, let us hymn a paean of praise or two to the night club operators who have so gallantly and unostentatiously made genuine helping-hand contributions.

These gyp-joints, where charity and brotherly love are as unexpected as they would be in Sing Sing or trench warfare, have quietly done more than their bit to feed the empty and clothe the shivering.

For instance, the Chateau Madrid is donating 10 per cent of its gross receipts for a month to the unemployment fund. The Cotton Club, where formerly flourished Duke Ellington and his Band (the torrid colored orchestra which strikes up some gay notes in the new Amos 'n Andy talkie), is feeding 300 persons every morning. Soup, meat, fruit, bread, and coffee are served.

Joe Moss of the Hollywood restaurant plans to serve nine-course feasts on Thanksgiving and Christmas days to half a thousand derelicts; and Will Oakland expects to go and do likewise. Mr. Moss also has a daily ration for the near-starving.

Last week 1,000 unemployed men were fed a steaming noonday luncheon by the Club Richman—the homesite of playboy Harry, the most talked-of ex-betrothed on Clara Bow's lengthening string. The Village Grove Nut Club turns over the total net receipts one night a week to funds for the unemployed.

It's just another phase of the old New York game—practiced so long and so successfully by the Tammany organization—of robbing the rich to aid the poor.

Before leaving the subject of night clubs, let us pause right here to set hinterland minds at rest about those wild goings-on in these New York dine-and-dance emporiums. In cross-roads parlance, "there ain't none."

Or at least, our very limited experience would lead us to believe that Manhattan night clubs are really very well regulated and orderly.

A man-about-town, who is also a professional bachelor and a high-powered salesman, took us to one of the newest and swankiest. It was designed modernistically, yet was as dignified as it was bizarre and geometrical. A well-blended orchestra played soft music from one corner of the room.

In the center of the room was one of those midget dance floors which invariably are discovered hiding behind some post in a night club, and on which dancing becomes a highly uncomfortable combination of a subway jam, a football crowd crushing through the exits of a stadium, aisle seats in a theatre when a party of eight squeezes through to the center of the row, and an hour of exercise on a mechanical hobby-horse.

On this floor couples danced—an extremely conservative type of dancing, featured by a rather unbecoming stance, in which the hands, arms, shoulders, and heads of the dancers locked, while the remainder of their bodies drifted further and further apart in an inverted V pattern (like so many animated Indian tepees).

The unusual quietness of this night club seems to be a part of the New York scheme. Street crowds are almost as silent as most electric refrigerator salesmen claim their units to be.

If one is jostled, an apology follows almost immediately. It's all very strange to one trained in the ways and manners (or lack of them!) of midwestern city crowds.

One spot in New York, however, boasts a daily riot of noise. Thirty-ninth street, from Eighth to Ninth avenues, is blocked off from traffic every noon, and into it pour thousands of garment workers for their midday gabfest.

Clothing of all sorts is made down in this district, chiefly by the sons of Abraham and daughters of Rebecca. They swarm into this roped-off block at noon and have a really enjoyable time discussing whatever it is that they discuss.

A passer-by can't help but stop for a moment to admire some of the magnificiently bearded patriarchs, who help people this teeming group.

The wisdom of all the ages seems to rest upon their stooped shoulders; and they have an utterly benign look. Peace, understanding, tolerance, patience, contentment. All these seem to be theirs.

Handsome young girls, lively middle-aged women, gesticulating men complete the picture. Some are participating in voluble dialogues. Others are laughing in little knots or big circular groups. The skull-capped patriarchs generally stand alone, in spirit "far from the madding crowd."

Another noisy New York crowd is to be found at football games. There were three big games going simultaneously, just like a three-ring circus (although you couldn't see the other two arenas) in town the Saturday we were there, and all drew monster crowds.

One of them practically filled the Yankee stadium to see the West Point contingent of the United States Army play the University of Illinois. No mob of students was ever any more boisterous, more prankish, or more vociferous than this assemblage.

Even New Yorkers occasionally lose their dignity, but one must go to a grid-iron contest to discover that heartening fact.

Traffic on the island that the Indians sold to the Dutch for a handful of Woolworth jewelry (that's an anachronism, but what care we, yo ho, yo ho) is all that it's cracked up to be. And it's cracked up often.

Going to a theatre a taxicab moves a few feet, sits on its haunches for several minutes, moves another yard, waits a bit longer, and so on far into the night. All intersection lights seem to be permanently red. Several traffic light changes can occur before one has traversed the block. Honest!

Through this traffic move occasional dinky little street cars, with now and then a more pretentious rail-wagon, and those famous Fifth Avenue double-deck buses.

These latter conveyances are exactly like the double-deckers to be found in Chicago, Detroit and other metropolis. And in the course of a day's riding (off and on, like the storied Misther Flannigan), we failed to discover one single spicy incident.

Fifth avenue buses, according to native New Yorkers, take care of the overflow from park benches of love-sick swains and amorous maidens, who proceed to make hay even while the sun shines and the world looks.

Cupid must have been on a holiday while we were observing, however, for the only fond glances we intercepted were directed toward bargain purchases by somewhat disheveled women.

Speaking of affaires de la coeur reminds us that the bachelor mentioned in an earlier paragraph maintains that his big quarrel with New York concerns that very subject.

Elsewhere, he says, one makes a date and calls on the girl in her home. One gets to see her in her native haunts. In New York the meeting place is more apt to be the lobby of the Astor, or some restaurant. Not a chance for one of those old-fashioned evenings by the fireside.

New York girls make up for their failure to provide home surroundings by their make-up (feeble attempt at a word play—thought we'd better label it). The W. T. Benda masque faces affected by Chicago young women are in the ascendancy here, too. Bright, sharp, tailored, vivid.

Smart indeed is the New York girl. Excellent taste seems to be the rule, and mediocre garbs the exception.

The famed sidewalks of New York are not only embellished with handsome women and nondescript apple-merchandisers, but have a full quota of wheedling racketeers who try, figuratively speaking, to sell the stranger the Pennsylvania station.

Perhaps it's a big diamond ring (25 cents around the corner in a novelty shop) which the panhandler must sacrifice in order to feed his starving kiddies. Or possibly it's the fellow who gives the girl by your side (if any) a rose and then tracks you until you pay for it to avoid embarrassment.

On Forty-second street there are several perpetual auction sales at jewelry stores. The newcomer sees the crowd, pokes his head in, hears nationally advertised trinkets knocked down at ridiculously low prices, swallows the bait, and proceeds to bid on jewelry of supposedly higher value and get hooked.

The "bait" articles are gathered in by hired accomplices, who also force the bidding on the articles with which the sucker is roped in.

This region also boasts a penny arcade and peep show, which is fully as rustic as any county fair. The barker advertises such stellar attractions as the Flea Circus, Hawaiian Dancing Girls, Crucified Man, Human Fountain, and the Muscular Marvel, all for the price of one dime, ten cents, the tenth part of a dollar.

After paying the dime to get in, one finds other doors, requiring more small change, leading to the various attractions. Penny-in-the-slot machines line the rooms and fill the corridors.

One of these one-cent movies offers a not-bad reproduction of the notorious "long-count" round in the second Dempsey-Tunney fight. Others are of "Her Bridal Night" type, which often go so far as to show a girl stepping out of a taxicab.

Curiosity of New Yorkers is traditional. We were treated to a good demonstration of it while standing idly in front of a hotel building

(Concluded on Page 5, Column 4)

Vending Industry Is Growing, Says Alexander

"WITHIN the next few years mass merchandising—of which the chain store is now the advance post—is to be placed on what might be called a quantity production basis," writes Harry W. Alexander, automatic merchandising engineer, in a reprint from *"Chain Store Age."*

"A solution at last has been found to the baffling problem of how to have more outlets without a tremendous increase in labor and rental costs. Robot, the mechanical salesman, is showing the manufacturers and distributors of small merchandise how to multiply the busy corners.

"Contracts have been made by the Consolidated Merchandising Corporation with United and Schulte Stores, Liggett's, and many other existing chains, for the installation of batteries of the so-called 'talking robots,' which sell cigarettes and other merchandise and by means of a phonograph record installed within the machine say 'thank you' and repeat the advertising slogan of the particular brand when a purchase is made."

Invisible Market

"Back of all this familiar equipment," he continues, "there is an even greater market which is as yet nationally invisible save to its creators. Its potentialities may be guessed from the statement that at least 200 corporations are now engaged in this country in the production of automatic selling machinery and cabinets. Some of these are devoted to merchandise, some to service, and some to highly developed coin and change-making devices.

"One of the latter now has reached a point of perfection at which the manufacturers can guarantee that it will reject counterfeit coins and slugs, taking nothing but silver, where nickels are not required. Others of an even more striking nature are in course of development.

"It is only a matter of demand, for example, until we shall have machines capable of returning silver change for a dollar bill, and perhaps for bills of larger denominations. I am informed from unquestioned industrial research authority that such a device may be worked out in any one of two or three ways.

"That development must wait, however, until automatic merchandising is ready for its ultimate aim—the twenty-four-hour-a-day arcade operated without attendants, 365 days a year. In the meantime a vast new market is being opened through the linking of machines with existing channels of distribution."

Refrigeration Invaluable

"The development of automatic refrigeration and increased use of Monel metal," avers Mr. Alexander, "has had a great deal to do with the opening of the opportunity of vending beverages. A vending machine is now being placed on the market, for instance, to sell milk to school children. It will be refrigerated by lamp socket electrical equipment. By its use parents are assured of absolute sanitation and cleanliness. My own organization has been active in working out refrigeration principles for a number of drink and ice cream vending devices."

"The fact is," he continues, "that no one is qualified at present to estimate the potential market for automatic merchandising. Every chain store proprietor knows that at present his advertising and promotion work sells more goods than he can deliver.

"For some years business men, particularly makers and distributors of nationally advertised small merchandise, have recognized that something must be done to cut the cost of distribution. Automatic selling, by releasing clerks for the handling of the products that require salesmanship, cuts costs in two directions."

Devices Improved

"It goes without saying," maintains Mr. Alexander, "that the types of machines now being put out to meet this wide variety of merchandising problems show a marked improvement over the familiar penny-in-the-slot equipment.

"In the first place they have been made foolproof or nearly so. Contrary to popular opinion, the chief problem of coin selling in a machine is not the direct losses through the substitution of slugs, but the stoppage of all selling that results from jamming the mechanism. In most cases that is due to an attempt to cheat, but in some it may be ascribed to a spirit of mischief.

"The direct losses are small and not enough to destroy the earning power of automatic merchandising even when the coin device is not modern and can be worked with slugs. This is shown by the experience of the Interborough New York subways. Out of a daily passenger list of 3,000,000 persons, the highest record of slugs in the coin turnstiles was 3,000 a day.

"Then the 'bull's-eye' was developed, keeping each fare visible for a few seconds through a bull's-eye lens in an electrically lighted receptacle. Now slugs have dropped to an average of about 600 a day and the average is constantly falling."

Lights Under Bushels

"The growth of automatic merchandising," he says, "illustrates the fact that a business or an industry can reach amazing proportions in this country before it becomes nationally visible.

"One of the most striking illustrations is the record of a washing machine chain, as it might be called, in the Middle West. This company conceived the idea of invading the apartment house market with washing machines equipped with coin devices. It obtained a discontinued style of washer from a widely known manufacturer, but a washer best adapted for the purpose, and put out a thousand of them after some preliminary tests.

"Apartment houses, it should be noted, are not good selling territory for the makers of washing machines, not only because of the lack of space, but because a great many apartment house dwellers want to create the impression that they have risen above doing their own washing.

Coin-Slot Laundries

"The coin device man conceived the idea of putting batteries of three or four machines in the basements of apartment houses and offering 35 minutes' use for a quarter, controlling the use through a coin-slot metering device. Income has ranged from $80 to $150 a year for each machine. Thus a new market is opened to the manufacturer which heretofore was closed to him.

"Another recent development is the equipment of motorized grocery chains with coin devices. As these are now being studied, they will be used at first chiefly for ice cream and candies, but there is no reason why most standardized small package goods at fixed prices in any field may not be sold through automatic machinery.

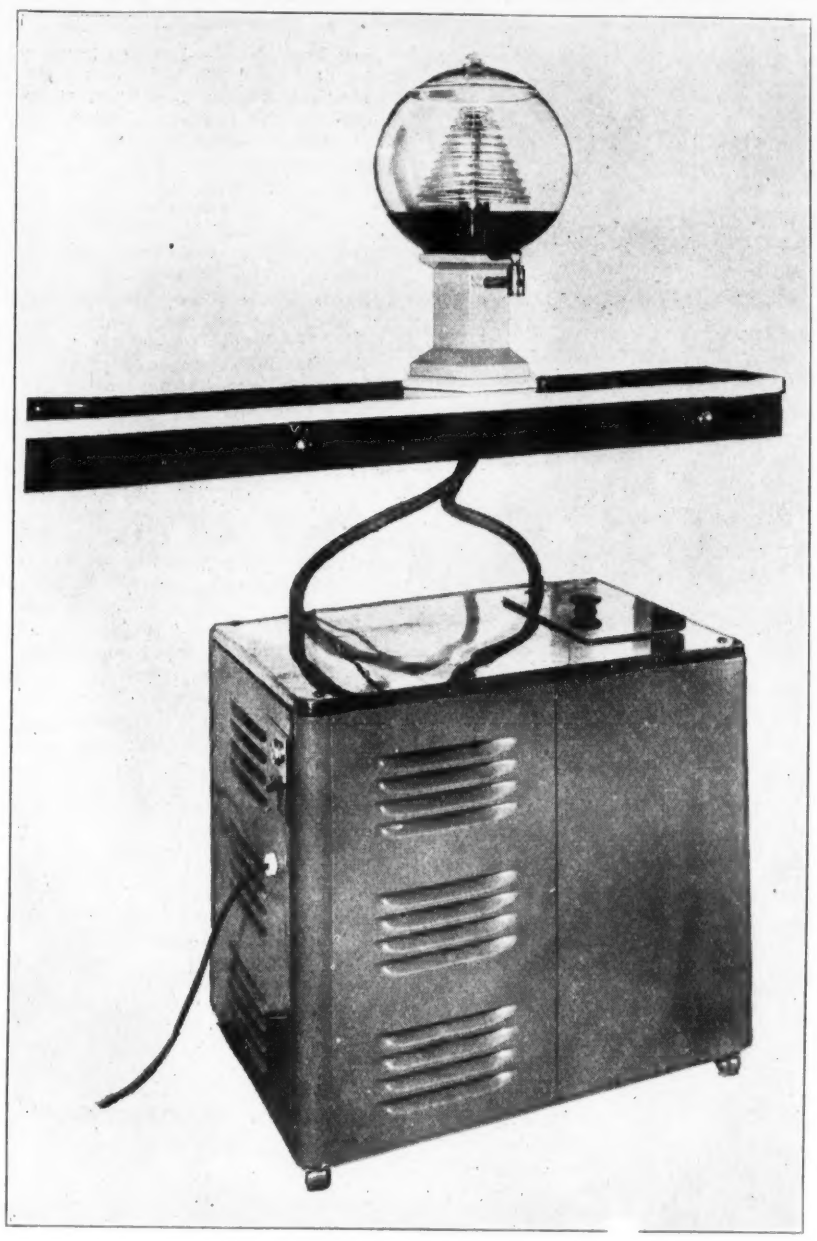
"In every case, however, it is necessary first to make a study of the potential market and to know accurately in advance the servicing costs. One firm in the Middle West lost $600,000 before it began to show a profit, simply because its market and costs had not been fully analyzed.

"Millions of dollars have been sunk in vending machine ventures because the trinity of right manufacturing, right selling, and proper servicing methods was not worked out. Each is essential to the other."

"At present there are five major forms of distribution of the machines," Mr. Alexander concludes, "and new variations are developing daily. Some companies make and operate their own machines, and have all the receipts and costs. Others make machines and lease them on a basis of so much per machine, or for a percentage of the intake.

"In some cases manufacturers of merchandise to be dispensed through machinery buy or make the equipment and lease it or loan it free in such a way that they can control its use, while others sell the machinery at cost and make their profit from the merchandise dispensed."

Light, Color, Motion



Eye-appeal is carried by the Autodrink counter beverage dispenser pictured above. Bubbling up and cascading over into a lighted globe, the drink is brought to the attention of the prospective customer by light, color, and motion. The refrigerated cooling cabinet is shown below the dispenser.

Automatic Distribution Will Solve Problems

(Concluded from Page 1, Column 5)

vantages of this method of distribution.

The Coca Cola Co., for instance, has been much disturbed by the fact that a "coke" in Omaha may taste quite different from one in Philadelphia, and has gone to great lengths to promote the sale of bottled Coca Cola mixed according to specifications. Automatic coin-operated machines, both bulk and bottle dispensing, have been more than welcome to beverage manufacturers who desire uniformity.

The advent of packaged quick-frozen foods should offer a new field of usefulness to the vending machine. Formerly the housewife went shopping for her meat, and examined carefully the cut before buying. With the new quick-frozen meats she buys packaged goods of uniform and dependable quality. She can get this kind of chops and steaks from a machine as easily as from a clerk, and much more economically.

Chain stores, among them the Woolworth, Kresge, McCrory, Metropolitan, W. T. Grant, Schulte, J. C. Penney, Union News, United Cigar, Happiness Candy, Walgreen Drug, Owl Drug, and Liggett Drug companies, have installed thousands upon thousands of automatic retailing devices.

Says A. Grant, vice-president of the United Cigar Stores Co.: "I would like to make clear that we are not trying out machine selling with a view to eliminating our clerks. Our whole idea is to supplement them. We want to take from them the burden of what might be called mechanical selling, with a view to improving service for customers who really require their attention. Analysis of sales shows that about 60 per cent of the clerks' selling is practically automatic."

The next big movement, it is predicted, will be the purchase of vending machines in large quantities by the manufacturer. The latter is constantly worried by the fact that amongst all the articles which the retail store has to sell, his product may be lost. A constant fight must be waged to get his goods on display in easily accessible places, and to get for them the sales presentation he wants.

With automatic machines the manufacturer can rest assured his goods are getting proper display, and can be sold quickly and easily.

When the retailer begins to find his store cluttered up with many sizes, styles and varieties of machines, he is likely to start looking for sectional vending equipment of uniform nature. That, in turn, will provide an incentive for standard package sizes. And when the latter two movements are safely under way, the era of automatic retailing will be making its bow.

To hasten the coming of the economy and efficiency which mechanical merchandising will bring, the vending machine and electric refrigeration industries can make great progress by getting together and working out the mutual problems which now face them.

Right now many companies have food vending machines in experimental stages. Further co-operation between engineers of the two industries should speed up the dawn of a new era in distribution.

Off Duty In New York

(Concluded from Page 4, Column 5)

munching one of those eternal apples.

A scarlet fire-truck rode by, and two of the firemen looked up at the skyward portions of the hotel. They continued to scan the ramparts until they passed on out of sight.

Immediately the handful of people who were then passing by on the other side of the street stopped and looked up at the hotel tower. In less time than it takes Floyd Gibbons to say "Jack Robinson," the sidewalk was packed with motionless, mouths-wide-open gazers.

Nothing happened, nor was anything to be seen except the stretch of vertical stone. Yet the crowd remained, and grew larger and larger.

That night we learned a despondent manufacturer had jumped to his death from a window of this hotel about an hour before the crowd gathered to look at nothing. The firemen who started it all were apparently looking for the X which should have marked the spot.

Advanced Machines Offered By Jones

Atlanta, Ga.—Advanced types of bottle-vending machines are presented by the Jones Products Co. of Atlanta. These include the Auto Drink Jr. and the Vend-a-Drink dispensers.

One of the chief features of Auto Drink Jr. is the bottle-moving element. The floor of each channel operates on a slide principle. As a bottle is removed by a customer and the service door opened for the next sale, another bottle moves forward to take the place of the one just removed.

Ice and water are used to refrigerate this machine. Every bottle is in ice-cold water up to its neck until taken out by the purchaser. From 25 to 50 pounds of ice is consumed daily by one machine. The capacity of this device is 72 bottles—an ysize or shape.

Two inches of cork insulation are included in the cabinet, which is of steel and galvanized iron, finished in white Duco and trimmed with nickel.

The Vend-a-Drink has all the features of the Auto Drink, Jr., and in addition is coin-operated. Its most notable characteristic is that it eliminates losses from the non-return of empty bottles.

A small brass key-check is issued with every bottle dispensed. The insertion of a dime is required to operate the machine; and when the empty bottle and key-check are returned to the machine the customer is automatically refunded a nickel.

This machine will also return a deposited coin when empty, and record each sale. Six different flavors (in bottles of varied shapes, if necessary) can be dispensed.

Either ice or electric refrigeration may be used to cool the water which surrounds the bottles.

ALABAMA FIRM OPERATES COMMISSION VENDERS

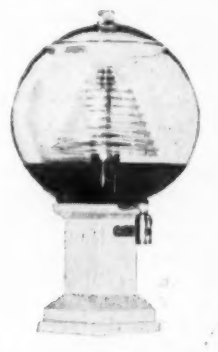
Birmingham, Ala.—For the last six years the Southern Automatic Sales Mfg. Co. has had a coin-controlled carbonated beverage dispenser under development. Today this company operates a substantial number of these units in diversified locations on a commission basis, according to Charles A. Hilty, president of the concern.

COLOR! LIGHT! ACTION! •

DOUBLES BEVERAGE SALES

ONE SQUARE FOOT OF COUNTER SPACE

(Requires space under counter for cabinet 28½ in. long, 20 in. wide by 26 in. high overall)



ILLUMINATED
(Within Glass Cascade)
ANIMATED
(Constant Motion)
REFRIGERATED
(Electrically or With Ice)

9 out of 10 are thirsty--

CASH IN WITH AUTODRINK

The Greatest Profit Producer Ever Devised for Selling Beverages

Now operating in New York Subways, Northwestern R. R. Depot (Chicago), South Station (Boston) Union News Co. Concessions, Playland (Rye, N.Y.) and many other locations selling "Orange Crush"

AUTODRINK CORPORATION

245 FIFTH AVENUE NEW YORK

Mechanical Selling Aids Distribution Says Merrell

"THE inability of a man to do as much unaided as he can do with machinery," writes W. F. Merrell, president of Remington-Rand Business Service, Inc., in a *Nation's Business* reprint, "is painfully apparent today in all of the great chain and department stores, where customers seeking standardized merchandise already sold to them by advertising are constantly walking out because the clerks cannot take care of their wants fast enough.

"It may be argued," he continues, "that the customer who walks out of one store will walk into another, and that the sale is recoverable in the long run. But money paid out twice for a single economic service represents a definite loss, and we cannot get away from the fact that the public, paying the bill, will have just so much less to expend for other purchases.

Advent of Machine

"For this reason the advent of the machine in distribution may be expected to influence before long the production and sale of everything we make, even of articles which in the present state of their development and the state of the market for them are beyond any conceivable automatic selling device.

"The obvious prospects for automatic merchandising now cover a wide range of tobacco products, toilet accessories, food and haberdashery—small articles in which the element of choice is determined by competitive advertising and not by personal salesmanship.

"By reducing the prices of these items—a reduction that may be left safely to competition—machine vending will turn back to the buyer, so to speak, that portion of his income now being used to pay for an unnecessary and therefore an uneconomic service. The saving may be infinitesimal to the individual, but in the mass it means a wave of increased buying power certain to benefit every industry, no matter how far removed from the coin-in-the-slot-machine.

Astonishing Expansion

"When the astonishing expansion of machine vending during the past few years is considered in the light of these potentials, the coin-in-the-slot device becomes as inevitable as an automatic drill, and its future as certain as mass production.

"It is conceivable also that it will have as revolutionary an effect on present merchandising methods as the machine had on manufacturing. Some of these changes already have been anticipated by the great tobacco and drug chains, which have been branching out steadily into new fields. Others are in sight. Groupings of merchandise furnishing the maximum in profit and service with an all-clerk system may be greatly changed by the development of machine vending.

Clothing Stores

"It has been suggested by Harry W. Alexander, a leading automatic merchandising expert, for example, that retail establishments heretofore devoted exclusively to the sale of men's clothing may increase their revenues by the use of machines to sell collars, handkerchiefs, garters and possibly toilet accessories. Machines already have been developed for the sale of these products, and there are others on the market handling wash cloths and soap, tooth brushes and similar toilet articles."

Other interesting recent developments, Mr. Merrell points out, include coin-operated gasoline filling stations, washing machines for apartment houses, beverage-dispensing apparatus, and any number of candy selling machines.

Widespread Fallacy

"My own company," states Remington-Rand's chief executive, "is not interested in the manufacture or distribution of any of this equipment, and I myself have no detailed technical knowledge of automatic selling machinery. As a manufacturer of business equipment requiring accuracy in the performance of highly complicated operations, however, I have been interested in observing a widespread fallacy concerning the reason for the present development of automatic merchandising.

"This manifests itself in the repeated statement that vending machines must be made fool-proof, a statement evidently based on the belief that the present development of machine vending is an outgrowth of the familiar and not very popular penny-in-the-slot-machine.

Outgrowth of Advertising

"The obvious fact is that the development now under way is an outgrowth of advertising and related mass selling effort, and that it has no economic relation whatsoever with the penny-in-the-slot machine. On the contrary, the economic tradition surrounding this machine, and the public lack of faith in it, represent actual obstructions, even though only temporary, to the general adoption of machine vending.

"The tradition is that nobody has ever made any money in the long run out of slot machines, and this may have a tendency to place an undue emphasis on the initial cost of equipment, and to follow or accept the limitations imposed by the penny.

"From the mechanical viewpoint the design of machines to do their work accurately does not seem to present any great difficulties, and several recent large-scale consolidations would seem to indicate that most of the problems already have been solved. It may be taken for granted also that the great tobacco and drug chains would hardly have placed orders for 100,000 batteries of the so-called 'talking robots,' as has been officially announced, without convicing tests of their serviceability. These machines sell two packs of cigarettes for a quarter, and by means of a phonograph record thank the customer and repeat the slogan of the manufacturer.

Need Merchandising Plan

"Where difficulty is far more likely to crop up in the machine-vending development is in the merchandising plan, or lack of plan. One group of middle-western investors is reported to have lost $600,000 in an automatic vending venture chiefly because the attempt was made to sell higher-priced merchandise on the penny-in-the-slot bases. The machines used were unattractive, they were placed in out-of-the-way corners, and no estimate was made in advance of the cost of service. The cost of service ate up all the profits. The group is now getting a satisfactory return following a merchandising survey.

"Apprehension has been voiced in some quarters as to the fate of the sales clerk if automatic merchandising is carried to its logical ultimate development. This is natural, perhaps, but I doubt if there is any more basis for the fear of widespread unemployment than there was in the so-called machine menace in production and in the control of business.

"The sales clerk who cannot make deliveries fast enough to accommodate the buyers created by advertising, and who adds more to the cost of the product than the service he furnishes is worth, is in a position similar to that occupied by the all-around machine craftsman 25 to 50 years ago. Whether we like it or not, he has become an economic burden, and unquestionably his own advancement is limited by that fact.

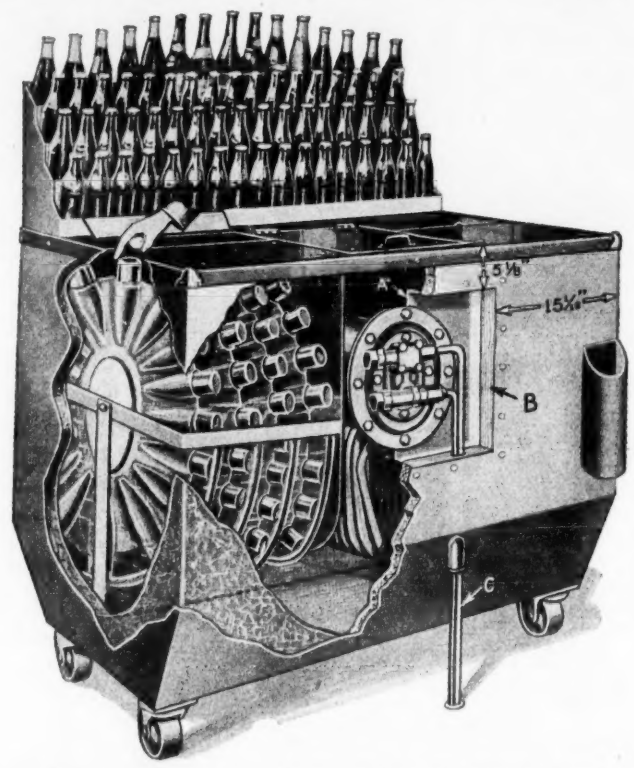
"In office as well as factory," concludes Mr. Merrell, "the ultimate effect of the machine, increasing per capita production, is to widen markets through lower costs and prices so that more men are needed to handle the expanded business.

Will Increase Opportunities

"The effect of automatic vending equipment on the sales clerk who really has something to contribute to salesmanship should therefore be to increase rather than to limit his opportunities. In the case of the clerk who has nothing to contribute in this respect, he cannot be any worse off than at present, and the change may compel him to find an occupation more suited to whatever his abilities may be.

"No other development in our commercial history has ever grown so rapidly as automatic merchandising, yet I doubt whether any acceleration of its rate of growth can be sufficient to cause any serious disturbance in the way of national unemployment."

Innards of An 'All-Syze'

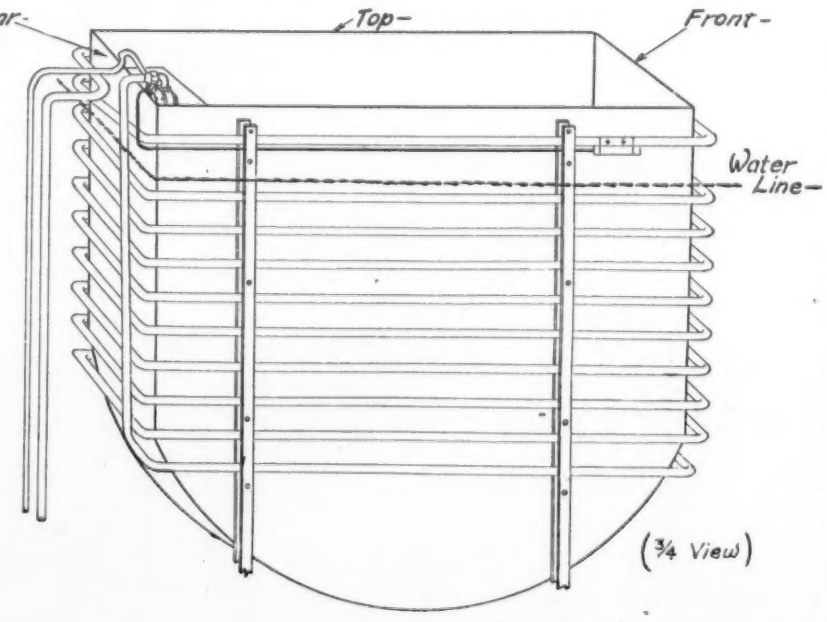


A cut-away reproduction of the "All-Syze Bottle Icer," manufactured by the S. & S. Products Co., Lima, Ohio, is shown above. Designed for use with an electric refrigeration unit, this bottled drink vender has a capacity of 80 bottles.

Detroiter

Barrels of Vernor's ginger ale are consumed daily by Detroit citizens.

Bottle Cooler Chamber



The cold storage chamber in the "All-Syze Bottle Icer" is surrounded by a cooling coil, as shown above. The expansion valve, with temperature control, is mounted on the rear upper edge of this chamber. A terminal outlet for the tubing is located at the upper rear of the center chamber. When used with a proper compressor, this chamber will maintain a temperature ranging from 36° to 44° F.

New York Concern Uses Dry Ice

New York, N. Y.—Dry Ice is the most economical and practical means of refrigerating vending machines, state engineers of the Serving Machine Corp., of 265 Canal Street.

This concern has done considerable experimenting with the adaptation of bottle water coolers to the dispensing of bulk drinks, and in developing refrigerated vending machines for candy, sandwiches, and Eskimo Pies.

Research into these problems was begun when the company began to have trouble keeping its candy from melting during the hot summer months. After trying both ice and mechanical refrigeration, solid carbon dioxide was decided upon as the most economical method of keeping their candy bars and confections fresh.

Ice did not do the job well enough, according to S. S. Stevens, of the Serving Machine Corp. Moreover, the ice required to keep the candy refrigerated occupied too much space in the machine.

For the small profits to be gained from a day's sale of candy bars by a small vending machine, mechanical refrigeration was too expensive, Mr. Stevens maintains.

The Eskimo Pie vender, cooled by Dry Ice, was unsuccessful and has been abandoned. Likewise the sandwich machines developed during the course of the experiments have been relegated to temporary retirement.

"Sandwiches won't stay fresh in a small machine longer than a day," says Mr. Stevens, "and if we refrigerate the machine it eats up all the profits. The solution would be large machines of considerable capacity, placed in positions where business would be sure to be brisk. In that case mechanical refrigeration could be installed and the machine would still return a fair margin of profit."

MAJESTIC FACTORIES USE VENDING MACHINES

Chicago, Ill.—Workers in the Majestic electric refrigerator or radio plants need not go afield in search of food. "Majestic Servers," automatic coin-operated devices which vend pies and sandwiches, are stationed at various convenient points in the Grigsby-Grunow factories.

Upon depositing a dime in the proper slot and turning a crank, one can get a choice of several varieties of pies and sandwiches. Both foods are wrapped in waxed paper and contained in square cardboard boxes.

Proceeds of these vending machines go to a mutual benefit fund maintained for all Majestic employees.

HARVEY TO MERCHANDISE VENDOLA OUTPUT

New York, N. Y.—N. Robert Harvey, of 11 West 42nd Street has recently contracted to merchandise the entire output of refrigerated food and drink machines manufactured by the Vendola Corp. of 636 Eleventh Avenue, according to officials of the latter organization.

Production on candy, drink, and other types of refreshment venders has just been begun by the Vendola organization. Experiments leading toward the development of many different devices to merchandise refrigerated foodstuffs are now under way under the direction of Vendola engineers.

Oil Station Owners Develop Fruit Vender

By Charles P. Rodman

Omaha, Neb.—Two years ago Floyd Jacobson and E. L. Kauffman, both young men in their twenties, formed a partnership and built an oil station at Chappell, Neb. They were located on the Lincoln Highway and did a fairly good business, yet it was not enough to keep both busy.

Early in the game they noticed many people asked for fruit. They considered adding a fruit stand to the station, but discarded the idea as being unpractical because it would consume too much time for the actual returns.

"All right," said Kauffman, "let's make an automatic machine that will do the business for us."

"I'm with you," replied Jacobson, and the job was begun.

As a result of this sudden idea, there is now a company in Chappell known as the Fruit Vending Machine Co. This company is composed of the two young men operating the gas station, and Ben Abben, of Storm Lake, Iowa, who is sales manager of the company.

The fruit vender is patented by Jacobson & Kauffman. It is made of sheet metal and stands 32 inches high and 22 inches across, and weighs 40 pounds.

There are six tubes in this device, loaded at the rear of the machine. These tubes will permit the passing of an orange or apple three inches in diameter,

Oil station apple and orange vender.

and carry a peck of each kind of fruit at one service.

There is a small lever, just over the word "selector" which, pushed to right, gives one an apple, but if pushed to left an orange appears.

After filling the machine from the rear, the machine is locked and there is no possibility of getting any of the fruit until five cents is deposited in the slot at the right, and the small handle given one complete turn.

The vender has been in operation for six months, has never made the error of giving something for nothing, and has netted the owners a dollar a day since putting in use. It will be placed on the market shortly by Ben Abben, Storm Lake, Iowa, and will be sold at $75. Oil stations, garages and small wayside inns comprise the big field of prospects, according to Mr. Abben.

AUTOMATIC SODA FOUNTAIN PATENTED RECENTLY

East Liverpool, Ohio—As soon as arrangements have been made with a manufacturer, the Manley Automatic Soda Fountain will be placed on the market, according to J. R. Manley, of the Manley-McGrew-Lytle Co. Preliminary tests have convinced Mr. Manley and his co-patentees that the device is now ready for quantity production.

Six different flavors are offered by the Manley machine. A nickel in the slot, a pull on the lever, and out comes a seven-ounce fiber cup filled with the flavor desired. Syrup and water are mixed just before dispensing.

The cabinet is all-steel. It is cooled by electric refrigeration. Six hundred drinks can be served with each filling of the machine, and the syrup containers can be refilled in less than three minutes. Patents were allowed on this machine August 30 of this year.

DYER MAKES REFRIGERATED VENDING MACHINES

New York, N. Y.—The Dyer Electric Cooler Corp. has developed a line of refrigerated vending machines of the two-stage type, which have been adapted from the mechanisms used in the Dyer electric water coolers.

These machines are provided with a receptacle for the delivery of containers or cups, and a material delivery mechanism, both of which are controlled by a coin-slot device.

A cup or container is first delivered, followed by a measured quantity of the material from the refrigerated compartment of the apparatus.

These machines can also be adapted to vending ice cream in bulk.

AUTOMATIC RETAILING MACHINES DIRECTORY

Manufacturers and Suppliers of Refrigerated Vending and Dispensing Devices

Automatic Food Venders

(Manufacturers and suppliers of coin-operated devices adaptable to the vending of candy, sandwiches, confections, fruit, etc.)

A. B. T. Mfg. Co.
2512 W. Monroe, Chicago, Ill.

Ad-Lee Co., Inc.
825 S. Wabash Ave., Chicago, Ill.

Advance Machine Co.
4545 E. Ravenswood Ave., Chicago, Ill.

Advance Vending Co.
347 W. 39th, New York, N. Y.

Aiman Novelty Co.
11 E. Austin Ave., Chicago, Ill.

American Sales Co.
922 Wrightwood Ave., Chicago, Ill.

Aluminum Foundry Co.
816 E. Pearl, Cincinnati, Ohio

James Atkinson
5434 W. Monroe, Chicago, Ill.

Auto Sales Corp.
1322 Wrightwood, Chicago, Ill.

Automatic Coin Machine Supply Co.
542 W. Jackson Blvd., Chicago, Ill.

Automatic Food Machinery Corp.
Boise, Idaho

W. D. Beardsley
Room 803—535 Fifth Ave., New York, N. Y.

Blue Bird Products Co.
907 Campbell, Kansas City, Mo.

E. A. Bostrom Mfg. Co.
Atlanta, Ga.

Brace Pressed Steel Co.
Elizabeth, N. J.

Brunhoff Mfg. Co.
Hulbert & Freeman Aves.
Cincinnati, Ohio

Buffet Distributing Co.
3122 5th Ave., Chicago, Ill.

Butler-Brayton Mfg. Co.
2140 5th, Detroit, Mich.

Caille Bros. Co.
6210 2nd Ave., Detroit, Mich.

California Sales Co.
2833 W. 25th, Chicago, Ill.

Cand-O-Matic Vending Co.
2458 Clifford, Detroit, Mich.

Chicago Slot Machine Exchange
11 E. Austin Ave., Chicago, Ill.

Columbia Machinery Works & Malleable Iron Co.
245 Chestnut St., Brooklyn, N. Y.

Columbus Vending Co.
Columbus, Ohio

Consolidated Automatic Merchandising Corp.
245 5th Ave., New York, N. Y.

Consolidated Vending Co.
106 E. Austin Ave., Chicago, Ill.

Cornine-Hakanson Die Casting Co.
225 E. 144th, Bronx, N. Y.

Crescent Specialty Co., Inc.
265 Wyckoff, Brooklyn, N. Y.

Curtis W. Emery, Inc.
1674 Broadway, New York, N. Y.

Derus Vending Attraction Co.
1809 Ellen, Chicago, Ill.

Detroit Coin Machine Co.
18302 Woodward, Detroit, Mich.

Downey, C. L. Co.
20 E. Jackson Blvd., Chicago, Ill.

Edible Nut Machine Co.
2535 W. Washington Blvd., Chicago, Ill.

Benjamin J. Ellis
P. O. Box 65, Yakima, Wash.

Erie Mfg. Co.
Hartford, Conn.

Fleishman Yeast Co.
(Packaged Yeast Vender)
699 Washington St., New York, N. Y.

Food Products Machinery Co.
1708-11 Conway Bldg., Chicago, Ill.

Food Service Co.
512 E. Bethune, Detroit, Mich.

Frohing Bros., Inc.
E. 46th and Prospect St., Cleveland, O.

Fruit Vending Machine Co.
(Apple and Orange Vender)
Omaha, Neb.

General Vending Corp.
245 5th Ave., New York, N. Y.

Glove Vending Co.
3033 Haussen, Chicago, Ill.

Gray Bros.
Plano, Ill.

Hance Mfg. Co.
Westerville, Ohio

Holcomb & Hoke Mfg. Co.
1545 Van Buren, Indianapolis, Ind.

O. D. Jennings & Co.
4309 W. Lake, Chicago, Ill.

Keeney & Sons Co.
700 E. 40th, Chicago, Ill.

Keyless Lock Co.
Indianapolis, Ind.

Kling Novelty Co.
2999 Montclair, Detroit, Mich.

Jenkins Mfg. Co.
29 S. Desplaines, Chicago, Ill.

Florence M. Jones
3519 Calumet Ave., Chicago, Ill.

Kone-Klutch Corp.
81 W. Van Buren, Chicago, Ill.

Kunkel Stamping & Mfg. Co.
425 E. Washington, Los Angeles, Calif.

L. A. Automatic Service Co.
2620 Cortland, Detroit, Mich.

Lemke Specialty Co.
6634 Gratiot Ave., Detroit, Mich.

Liberty Novelty Co.
3557 W. 22nd, Chicago, Ill.

Mabey Electric & Mfg. Co.
968 Fort Wayne Ave., Indianapolis, Ind.

Maniken Vender Co.
341 E. 33rd St., N., Portland, Ore.

Marlazar, Inc.
640 Hudson, New York, N. Y.

Mechanical Sales Co.
5901 4th St., Detroit, Mich.

Mid-West Pack Shop, Inc.
228 N. LaSalle, Chicago, Ill.

Miller-Wiggin Mfg. Co.
Dayton, Ohio

Mills Novelty Co.
4110 Fullerton, Chicago, Ill.

Nagel-Chase Mfg. Co.
2811-23 N. Ashland Ave., Chicago, Ill.

National Automatic Machine Co.
2196-2206 University, St. Paul, Minn.

National Coil Machine Co.
200 N. Jefferson, Chicago, Ill.

National Gum & Machine Co.
42 Spring, Newark, N. J.

National Mfg. Co.
Greenfield, Ind.

National Sales Machine Co.
1926 Chestnut, St. Louis, Mo.

National Vending Corp.
6743 Roosevelt Ave., Detroit, Mich.

Norris Mfg. Co.
Columbus, Ohio

Northwestern Corp.
Morris, Ill.

Novix Specialty Co.
(Made to Order)
1193 Broadway, New York, N. Y.

Onliway Corporation
1603 Laflin, Chicago, Ill.

Premium Novelty Co.
538 S. Dearborn, Chicago, Ill.

Prepayment Utilities Service Corp.
1553 Devon Ave., Chicago, Ill.

Pioneer Automatic Merchandising Corp.
912 Mich. Theatre Bldg., Detroit, Mich.

Wm. Rabkin
445 W. 31st, New York, N. Y.

Reliable Automatic Exchange
211 W. 18th St., New York, N. Y.

Rex Novelty Co.
3208 Southport, Chicago, Ill.

Richmond Engineering Co.
2916 Salmon, Philadelphia, Pa.

D. Robbins & Co.
28 Dodworth, Brooklyn, N. Y.

Rockola Mfg. Co.
625 W. Jackson Blvd., Chicago, Ill.

Rodder Vending Machine Co., Inc.
Seneca Falls, N. Y.

Frederick Rouff
245-47 N. J. R. R. Ave., Newark, N. J.

Rowe Vending Machine Co, Inc.
1338 South Flower St., Los Angeles, Calif.

Rushour Co.
Madison, Wis.

Sanders Mfg. Co.
Nashville, Tenn.

Sanitary Automatic Candy Corp.
315 E. 91st St., New York, N. Y.

Schermack Corp. of Michigan
1164 W. Baltimore, Detroit, Mich.

Serving Machine Corp.
265 Canal, New York, N. Y.

Sicking Mfg. Co.
1922 Freeman, Cincinnati, Ohio

Silver King Novelty Co.
611 No. Capitol Ave., Indianapolis, Ind.

Simmons, Allan O.
1105 Lawrence Ave., Chicago, Ill.

Simplex Tool Co.
Woonsocket, R. I.

Robert D. Simpson Co.
Columbus, Ohio

Slug Rejecting Vending Mach. Co., Inc.
29 W. 15th, New York, N. Y.

Snax Automatic Stores, Inc.
2812 Book Tower, Detroit, Mich.

Specialty Mfg. Co., Inc.
724 N. Racine, Chicago, Ill.

Star Mfg. Co.
4569 Swan Ave., St. Louis, Mo.

Strickfaden, Alma E.
11 E. Austin, Chicago, Ill.

Universal Vending Service Corp.
4600 Broadway, Chicago, Ill.

Vendicater Co.
Williamsport, Pa.

Vending Machine Co. of America
Tulsa, Okla.

Warner Implement Co.
Hammond, Ind.

Watling Mfg. Co.
4650 Fulton, Chicago, Ill.

Western Apple Service Co.
(Apple Vender)
Bell St. Dock, Seattle, Wash.

Woodhaven Metal Stamping Co., Inc.
62 Schenectady Ave., Brooklyn, N. Y.

Yu Chu Co.
9 Broadway, Newark, N. J.

Z. & A. Vending Co.
1152 W. Marquard, Chicago, Ill.

Automatic Bulk Drink Venders

American Cuptor Corp.
200 Hudson St., New York, N. Y.

Auto Fount, Ltd.
417 Vancouver Block, Vancouver, B. C.

Automatic Oasis Co.
617 No. Rampart St., New Orleans, La.

Automatic Sales Machine Co.
652 Brown-Marx Bldg., Birmingham, Ala.

George A. Ball
410 Kasota Bldg., Minneapolis, Minn.

Harry A. Bell
541 Clapier St., Philadelphia, Pa.

Bee-Jay Products Co., Inc.
23 St. & 40th Ave., Long Island City, N. Y.

C. L. Carter
347 W. 55th, New York, N. Y.

C. C. Doering
1375 W. Lake St., Chicago, Ill.

Drink-O-Lette
114 Lincoln Ave., Merrick, Long Island, N. Y.

Thomas Parker Dudley
5820 Seville Ave., Huntington Park, Cal.

Fairfield Manufacturing Co.
Philadelphia, Pa.

Sol Fligelman
150 Broadway, New York, N. Y.

R. H. Frisby
1239½ Greenleaf Ave., Chicago, Ill.

General Products Corp.
2736 Charlotte St., Kansas City, Mo.

Glascock Bros. Mfg. Co.
5th St. and Perkins Ave., Muncie, Ind.

G. H. Heitman
130 or 230 W. 13th St., New York, N. Y.

National Autofount Corp.
65 V St., N. W., Washington, D. C.

Kalomat Corp.
410 North Michigan Ave., Chicago, Ill.

Bernard Kanter
5801 Cedar Ave., Philadelphia, Pa.

Kelly Dry Pure Juice Corp.
342 Madison Ave., New York, N. Y.

Francis H. Love Co., Inc.
75 West St., New York, N. Y.

Universal Metal Mfg. Co.
P. O. Box 449, Birmingham, Ala.

Manley-McGrew-Lytle Co.
East Liverpool, Ohio

W. Millard
16 W. Fairview Ave., Valley Stream, L. I. N. Y.

National Servier-Self System
126 Linden Park St., Roxbury, Mass.

Otis A. Roberts & Co., Inc.
623 First National Bank Bldg., Oklahoma City, Okla.

Lawrence S. Roney
Box 335, Berwyn, Pa.

Jos. A. Schermack
10 East 40th St., New York, N. Y.

Schusters, Inc.
Cor. Huron Road & East Fourth St., Cleveland, Ohio

Snax Automatic Corp.
2812 Book Tower, Detroit, Mich.

Sodamat Corp.
25 West 43rd St., New York, N. Y.

Southern Automatic Sales Mfg. Co.
524 Second Ave., No., Birmingham, Ala.

Wade Products Co., Inc.
289 Elmhurst Ave., Detroit, Mich.

Waltz Typewriter & Adding Machine Co.
658 Main St., Cincinnati, Ohio

M. E. Whitney
2736 Charlotte St., Kansas City, Mo.

Automatic Bottle Drink Venders

Coco-Cola Bottling Co.
1134 Central Ave., Los Angeles, Cal.

J. F. Fitch
Buchanan, Va.

E. J. Jones
P. O. Box 428, Atlanta, Ga.

Frank F. Pasch Co.
237 East Water St., Milwaukee, Wis.

Peerless Machinery Co.
Fourth and Michigan Aves., Joplin, Mo.

Ralph R. Rogers
614 Market St., Knoxville, Tenn.

Carl H. Schultz Co.
118 N. 11th, Brooklyn, N. Y.

Tavernette Corp.
211 West Wacker Drive, Chicago, Ill.

Automatic Ice Cream Venders

Aut-O-Cream Vending Machine Co.
New Brunswick, N. J.

Harry D. Burt
325 West Federal St., Youngstown, Ohio

Eskimo Pie Co.
Louisville, Ky.

I. Fischman & Sons Co.
Erie Ave., F to G Sts., Philadelphia, Pa.

"Frigivend"
Osborne Register Co.
Osborne Register Co.
123 West Peark St., Cincinnati, Pa.

Hershey Chocolate Co.
Hershey, Pa.

E. H. Ingle
43 West Hadley Rd., Dayton, Ohio

Keith Kiggins
New York Life Bldg.
51 Madison Ave., New York, N. Y.

New York Eskimo Pie Corp.
110 Bridge St., Brooklyn, N. Y.

Polar Vend Corp.
10 Dickman St., Augusta, Me.

Taylor Freezer Corp.
Beloit, Wis.

Bulk Drink Dispensers (not coin-operated)

American Thermos Bottle Co.
Norwich, Conn.

Autodrink Corp.
245 Fifth Ave., New York, N. Y.

Cordley & Hayes
145 Hudson St., New York, N. Y.

Dyer Electric Cooler Corp.
1071 6th Ave., New York, N. Y.

W. A. W. Hamilton & Sons
829 Montrose Ave., Chicago, Ill.

Harrison's Orange Huts
Chicago, Ill.

Perfection Cooler Co.
Michigan City, Ind.

Richardson Corp.
Rochster, N. Y.

Sintzel Orange Mills
Venice, Cal.

Vernor's Ginger Ale
233 Woodward, Detroit, Mich.

Bottle Drink Dispensers (not coin-operated)

Frigidaire Corp.
Dayton, Ohio

Icy-O Company, Inc.
Charlotte, N. C.

Liquid Carbonic Co.
Chicago, Ill.

Miller Bottle Cooler Co.
Bainbridge, Ga.

S. & S. Products Co.
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